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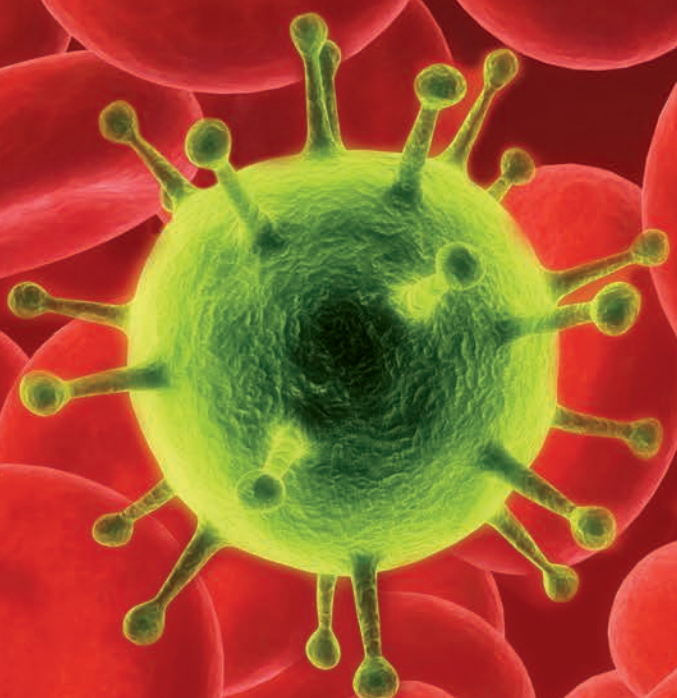
AIDS
Deniers vs. Science



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Editor's Note

AIDS Denialism and Science

We who try to defend good science and expose sham science are often asked what harm it does to believe in [take your pick of any of scores of unsupported claims]. One area where the harm is almost self-evident is AIDS. Those who deny the overwhelming scientific evidence that AIDS is caused by the human immunodeficiency virus (HIV) have already caused immense suffering. In countries like South Africa, where AIDS is especially widespread and devastating, progress to contain and treat the disease has long been impeded by steadfast antiscientific beliefs—promoted by President Mbeki and others—that the cause has nothing to do with human-to-human transmission of the HIV virus. Also, a few "dissident" scientists around the world continue to contend that AIDS science is all wrong and that AIDS deaths are caused by malnutrition, narcotics, and the drugs used to treat the disease.

In this issue, Nicoli Nattrass, director of the AIDS and Society Research Unit at the University of Capetown, gives an insightful look at AIDS denialism and the quandaries it poses for the scientific community and the public. Author of a just-published book on the subject, she shows how the denialists try to pretend there is still a scientific "debate" or "controversy" about the cause of AIDS, an echo of tactics used in the West by evolution deniers. As she says, "Dissent and critique are, of course, central to science, but so, too, is respect for evidence and peer review." Where, several decades ago, the pathogenesis of AIDS was less understood and some resistance to the mainstream scientific view was understandable, the science has long progressed far beyond that. We now understand that HIV works by undermining the immune system, making the body vulnerable to all variety of infections. Nattrass outlines the denialists' continued misrepresentations and rhetorical tactics, and she ascribes to them some blame for "unnecessary suffering and deaths."

* * *

We were recently shocked to lose a close colleague and friend, Barry Beyerstein. A longtime member of the CSI Executive Council and SI Editorial Board, Beyerstein died unexpectedly of a heart attack June 25, less than a month after his sixtieth birthday (see page 12). We had seen him only ten weeks earlier at a CSI meeting in Washington, and he was to teach, as usual, at our annual Skeptics' Toolbox workshop in Oregon in August. Barry was with the Brain Behavior Laboratory at Simon Fraser University. He had a psychologist's understanding of the human foibles and neurological processes that lead to acceptance of unsupported beliefs and a gentleman's thoughtful delicacy in teaching us about all that. Our hearts go out to his family.

We also lost a thoughtful and talented observer of science and the human condition, who, over the years, used his sharp mind, wit, and literary talents to explore many conundrums about how science works (and sometimes doesn't) and how we often take ourselves too seriously. Ralph Estling's latest, typically wide-ranging Forum essay was going into layout in this issue (see page 57) when he died at his home in Somerset, England, at the age of 77. More on this unique man will be published in a future issue.

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THE MAGAZINE FOR SCIENCE AND REASON

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Gallup Polls Show Splits on Evolution (Dis)Belief by Politics, Religion

Not that we needed more evidence of Americans' disbelief in evolution, but the results of several Gallup Poll questions released in June provide still more documentation of the way religious and political beliefs permeate the evolution/creation issue.

The polls found—to the surprise of few observers—that the majority of Republicans in the United States do not believe that the theory of evolution is true and do not believe that humans evolved over millions of years from less advanced forms of life.

As the Gallup pollsters note, this suggests that when three Republican presidential candidates at a May debate stated they did not believe in evolution, they were generally reflecting the view of the bulk of the rank-and-file Republicans whose nomination they were seeking.

Scientific principles, of course, are not reached through opinion polls. But the climate of public opinion about evolution strongly affects science education at the secondary level and all political and social discourse on evolution—a topic scientifically well accepted but politically and socially still highly controversial.

Independents and Democrats are more likely than Republicans to believe in "the theory of evolution," the poll found. But, even among non-Republicans, there appears to be a significant minority who doubt that evolution adequately explains where humans came from.

The findings are based on several recent Gallup Polls conducted in May and June, showing that a significant number of Americans have doubts about the theory of evolution.

The new poll data suggest that Americans' religious behavior is highly correlated with beliefs about evolution. Those who attend church frequently are much less likely to believe in evolution than are those who seldom or never attend. Republicans tend to be frequent churchgoers, the pollsters say.

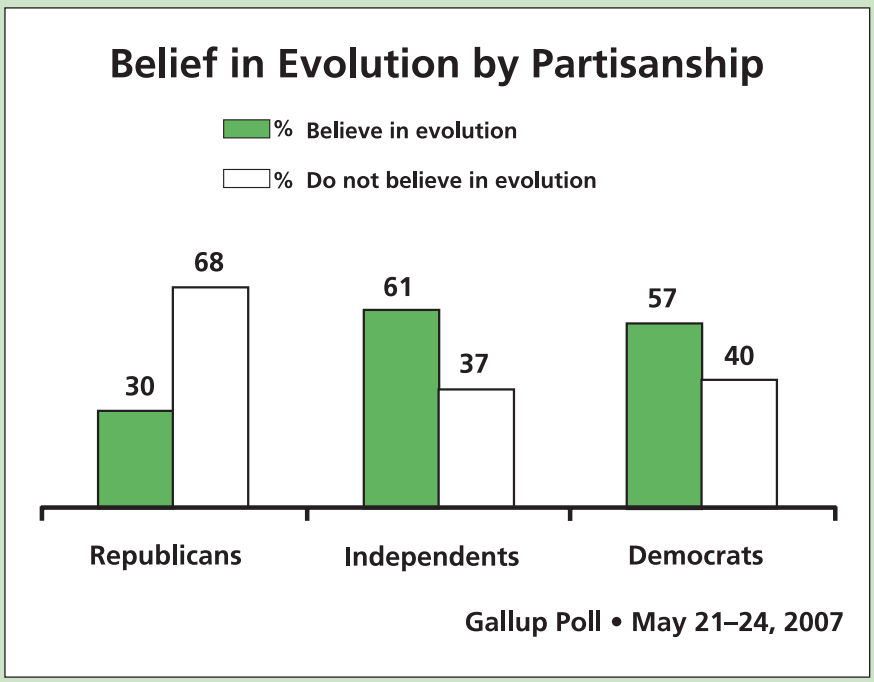
The data indicate some seeming confusion on the part of Americans on the evolution/creationism issue. About a quarter of Americans say they believe *both* in evolution's explanation that humans evolved over millions of years and in the creationist explanation that humans were created as we are now about 10,000 years ago.

One such question, included in a May Gallup Panel survey, asked, "Now thinking about how human beings came to exist on Earth, do you, personally, believe in evolution, or not?" Gallup says it is important to note that this question included a specific reference to "thinking about how human beings came to exist on Earth" that oriented the respondents toward an explicit consideration of the implication of evolution for man's origin. Results may have been different without this introductory phrase. With that said, Americans' responses to this question are essentially split down the middle. About half say they do believe in evolution and about half say they do not.

A second question, included in a June 1–3 *USA Today*/Gallup poll, asked about evolution side by side with a similar question about creationism: "Next, we'd like to ask about your views on two different explanations for the origin and development of life on earth. Do you think Evolution—that is, the idea that human beings developed over millions of years from less advanced forms of life—is definitely true, probably true, probably false, [or] definitely false?"

These results are similar to those from the question asked in May. A little more than half of Americans say evolution—as defined in the wording of this question—is definitely or probably true. Forty-four percent say that it is probably or definitely false. In contrast, even more Americans, two-thirds, say the theory of creationism is definitely or probably true.

A separate Gallup Poll trend question—also asked in May—gave Americans three choices about humanity's origins. Responses to this question found



that 43 percent of Americans choose the alternative closest to the creationist perspective, that "God created human beings pretty much in their present form at one time within the last 10,000 years or so." A substantial 38 percent say human beings evolved but with God guiding the process. Another 14 percent favored an interpretation of evolution arguing that God had no part in the process, leaving a total of 52 percent who say humans evolved, with or without God's direction.

Gallup summarized the results of these three questions about evolution and human origins this way:

> Across the three question wordings, the data show consistently that about half of Americans agree with the theory of evolution, believe that the theory of evolution is probably or definitely true, or believe that humans developed over million of years with or without God's guidance. Belief in the idea that humans were created pretty much as is 10,000 years ago is somewhat more dependent on the way in which this concept is measured. A little more than four out of ten Americans—when presented with three alternatives—say they believe that God created humans in their present form 10,000 years ago. At the same time, two-thirds of Americans in a stand-alone question say they believe in the theory of "creationism"—defined as the idea that humans were created in their present form 10,000 years ago.
>
> It might seem contradictory to believe that humans were created in their present form at one time within the past 10,000 years and at the same time believe that humans developed over millions of years from less advanced forms of life. But, based on an analysis of the two side-by-side questions asked this month about evolution and creationism, it appears that a substantial number of Americans hold these conflicting views.
>
> These results show that:
>
> Twenty-four percent of Americans believe that both the theory of evolution and the theory of creationism are probably or definitely true; 41 percent believe that creationism is true and that evolution is false; 28 percent believe that evolution is true but that creationism is false; 3 percent either believe that both are false or have no opinion about at least one of the theories.
>
> Without further research, it's not possible to determine the exact thinking process of those who agreed that both the theory of evolution and creationism are true. It may be, however, that some respondents were seeking a way to express their views that evolution may have been initiated by or guided by God, and told the interviewer that they agreed with both evolution and creationism in an effort to express this more complex attitude.

Confusion. Contradiction. Disbelief. Sounds pretty much the way the evolution/creation debate has been in the United States for a long time. And—unless circumstances dramatically change—probably will remain so far into the future.

—Kendrick Frazier

One Small Victory in Canada in Support of Evolution

There was a small Canadian victory for evolution and against intelligent design recently when Bruce Pendergast, a subscriber to SI, wrote all 306 of Canada's Members of Parliament in an effort to nip in the bud any invasion of Canada by the proponents of ID. Here is his story:

Gary Bauslaugh, a Canadian technical advisor to the Skeptical Inquirer, sent me an e-mail pointing out that two employees of the Social Sciences and Humanities Research Council (SSHRC) harbored doubts about the validity of evolution. I had been reading about some almost successful assaults on evolution by the intelligent-design crowd in the United States and decided to do what I could to prevent such nonsense from invading Canada's educational system. So I wrote all 306 Members of Parliament, expressing my concern that two civil servants would voice doubt about evolution while apparently ignoring the utter lack of evidence supporting ID.

I admit my letter was deliberately written as if I was killing a flea with a sledgehammer, suggesting, as it did, far more outrage than I really felt. Though a published author with reasonable writing skills, I chose to write the MPs in a pedestrian style, assuming it would pack more punch than one of literary merit.

Much to my delight, I have received sixteen replies, including a personal response from the Minister of Industry himself, the Honourable Maxime Bernier. Apparently, many of those 306 MPs simply passed my letter on to his desk, since it is his portfolio that oversees SSHRC. Since then, I've had a delicious fantasy imagining Bernier getting yet more hordes of copies of letters each morning from this unknown nuisance.

For some reason, he addresses me as *Doctor* Pendergast. I am unaware whether he thinks I'm a medical man (MD) or a scholar (PhD). I am neither. However, it appears that my mild diatribe has paid off in some small way, for Bernier, a very well respected member of the Cabinet, also sent me a copy of the unofficial minutes of SSHRC, in which it is stated, "SSHRC issued a public statement on April 11, 2006, stating that the theory of evolution is not in doubt." Since that date precedes my involvement, I was apparently tilting at a nonexistent windmill. However, we must also remember that it was only in January 2006 when we elected a whole new slate of Members, and I suppose it is a good idea to keep them on their toes. More important, of course, is the fact that there are 306 elected Members of Parliament who now know there's someone out there who refuses to let sleeping dogs lie.

When I showed my letter to a friend, he asked me why I had written it in such a confrontational manner, and I explained how one trains an elephant. First, whack him right between the eyes with a baseball bat. When my friend asked how that could help, I said, "Now I've got his attention." Well, I suppose my letter at least got their attention.

—Bruce Pendergast

For a copy of Bruce Pendergast's letter, e-mail him at brucep@golden.net.

CFI Calls for Protecting Science and Research Findings from Political Interference

The Center for Inquiry, in a new position paper on scientific integrity, has called for legislation to protect scientific research and the dissemination of findings of scientific research.

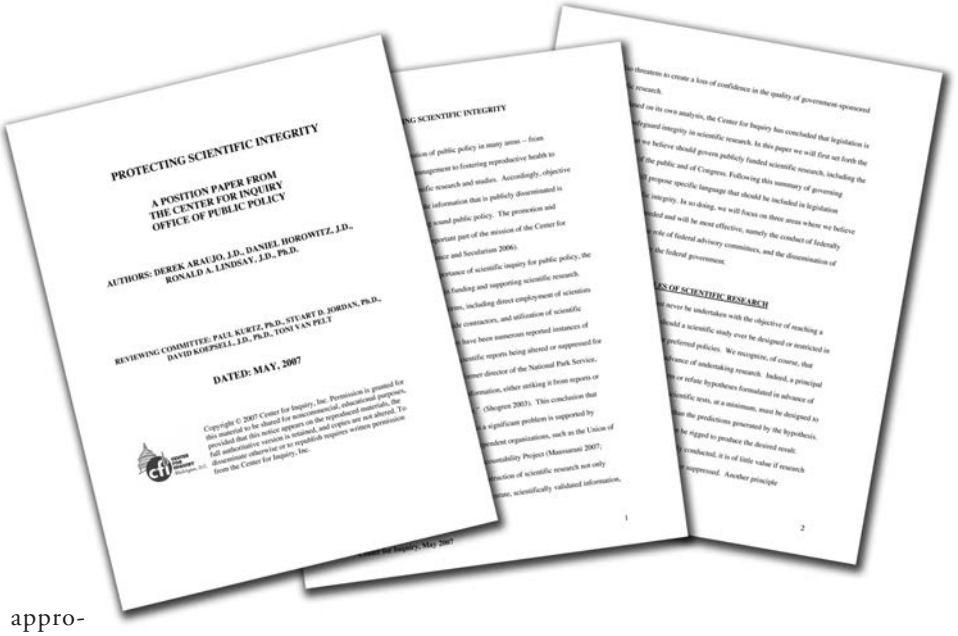
In a May 2007 position paper, "Protecting Scientific Integrity," authors Derek Araujo, Daniel Horowitz, and Ronald A. Lindsay offer a number of recommendations for protecting scientific inquiry from political interference. The CFI inquiry was prompted by, among other things, a number of reported instances of scientific reports being altered or suppressed for political reasons. The full forty-seven-page paper is available on CFI's Web site at www.centerforinquiry.net/advocacy/protecting_scientific_integrity.

"This obstruction of scientific research not only prevents public policy from being based on accurate, scientifically validated information, but also threatens to create a loss of confidence in the quality of government-sponsored scientific research," say the authors.

The paper concludes that legislation is needed to safeguard integrity in scientific research, and it proposes specific language for inclusion in such legislation. The authors focused on three areas—the conducting of federally supported research, the role of federal advisory committees, and the dissemination of scientific information by the federal government.

On the first of these, they are direct: "To put it more bluntly: research must not be rigged to produce the desired result." And, they emphasize, "even if research is properly conducted, it is of little value if research data and findings are manipulated, censored, or suppressed." The authors say they recognize that there are distinctions between research and policy recommendations, and the latter should incorporate policies considered in the public interest. "However," they add, "the discretion to make policy recommendations does not under any circumstance justify altering or suppressing data or findings."

As for advisory committees, there is legislation that currently governs such committees, namely the Federal Advisory Committee Act (FACA), 5 U.S.C. app. 2. But the authors say ". . . this legislation has not been completely effective in providing public oversight of the work of such committees nor in ensuring that these committees are appropriately balanced with qualified experts. FACA has proven inadequate for a variety of reasons. . . ."


PROTECTING SCIENTIFIC INTEGRITY

A POSITION PAPER FROM
THE CENTER FOR INQUIRY
OFFICE OF PUBLIC POLICY

AUTHORS: DEREK ARAUJO, J.D., DANIEL HOROWITZ, J.D.,
RONALD A. LINDSAY, J.D., Ph.D.

REVIEWING COMMITTEE: PAUL KURTZ, Ph.D., STUART D. JORDAN, Ph.D.,
DAVID KOEPSELL, J.D., Ph.D., TONI VAN PELT

DATED: MAY, 2007

The paper suggests legislative reform that will promote disclosure of conflicts of interest and increase the transparency of the work of advisory committees. These objectives, they say, can be accomplished via amendments to FACA or through separate legislation.

They also recommend that Congress reestablish the Office of Technology Assessment, "which we believe functioned well as an impartial, nonpartisan resource for Congress prior to its abolition in 1995."

The paper also suggests several revisions to the Restore Scientific Integrity to Federal Research and Policymaking Act (H.R. 839), introduced in the House of Representatives by the 109th Congress in 2005. That bill addressed several issues relating to scientific integrity.

Based on their own analysis, the CFI authors propose several revisions to the bill. The revisions, they say, would help to ensure that the bill, assuming it is reintroduced, succeeds. These provisions have to do with preventing interference with science in general, preventing tampering with research, preventing censorship, and preventing dissemination of false or misleading information.

"Federally funded scientific research and analysis must be unobstructed, transparent, and timely," the CFI paper concludes. "It is no exaggeration to state that safeguarding the integrity of scientific research is essential both to maintain a free, democratic society and to maintain the leadership of the United States in scientific and technological innovation."

—Kendrick Frazier

Carroll, Forrest, Kroto Elected CSI Fellows; Mooney, Nisbet Named Consultants

Three noted scholars have been elected Fellows of the Committee for Skeptical Inquiry in recognition of their distinguished contributions to science and skepticism. The CSI Executive Council elects fellows on a periodic basis. The new fellows are:

Sean B. Carroll, professor of molecular genetics, University of Wisconsin–Madison. Carroll, also an investigator with the Howard Hughes Medical Institute, is a researcher in molecular genetics and the author of two recent books for the intelligent public about evolution: *Endless Forms Most Beautiful: The New Science of Evo Devo* and *The Making of the Fittest: DNA and the Ultimate Forensic Record of Evolution.* (Both have been excerpted in SI.) His research has been published in a wide variety of journals, and he also writes for popular periodicals, having been called "the new, user-friendly face of evolutionary science."

Barbara Forrest, professor of philosophy, Southeastern Louisiana University. Forrest is the author (with Paul R. Gross) of *Creationism's Trojan Horse: The Wedge of Intelligent Design.* She has become an expert on the intelligent-design movement and was one of the key expert witnesses for the plaintiffs in the 2005 *Kitzmiller et al. v. Dover School District* trial that ended in the judge ruling that ID is not science "but a religious view" and that teaching it as science violates the Constitution. Her first-person report on that experience appeared in our January/February 2007 issue. She teaches a wide variety of philosophy courses, including History and Principles of Evolution, and is active in efforts to promote church-state separation and the integrity of public science education.

Harry Kroto, professor of chemistry and biochemistry, Florida State University, and a Nobel Laureate. Kroto shared the 1996 Nobel Prize in chemistry with the late Richard Smalley and Robert F. Curl Jr. for their discovery of fullerenes, carbon atoms bound in the form of a ball, popularly called "buckyballs." It opened an entirely new field of chemistry. Much of his career was spent at the University of Sussex, where he was a professor of chemistry and a Royal Society research professor. But he has also been an outstanding communicator, working on behalf of the public understanding of science. In 1995, he created the Vega Science Trust to create high-quality science films for network-television broadcast in the U.K. that reflect the excitement of scientific discovery and intrinsic concepts and principles. He has also been

Quack Attacker Returns after Legal Threat

The quackbusting blog of David Colquhoun, a renowned British professor of pharmacology, was removed on May 30, 2007, from his university's servers—but subsequently reinstated—after legal bullying by one of his hapless targets.

Herbal practitioner Ann Walker believes that Neanderthals were merely "regular humans" suffering from a lack of vitamins and also touts red clover as a most wonderful "blood cleanser." Professor Colquhoun, of University College London (UCL), retorted on his blog, Improbable Science, that the phrase "blood cleanser" has no scientific meaning, whatsoever, and is just "so much meaningless gobbledygook." Marshaling weighty evidence against Walker, he challenged her to define the phrase.

Instead, Walker's husband, Alan Lakin, complained to Malcolm Grant, the provost of UCL, that Colquhoun was guilty of defamation, misuse of university resources, and infringement of copyright (that is, he quoted her!). Fearing a lawsuit, the provost had Colquhoun remove his Web site from UCL's servers.

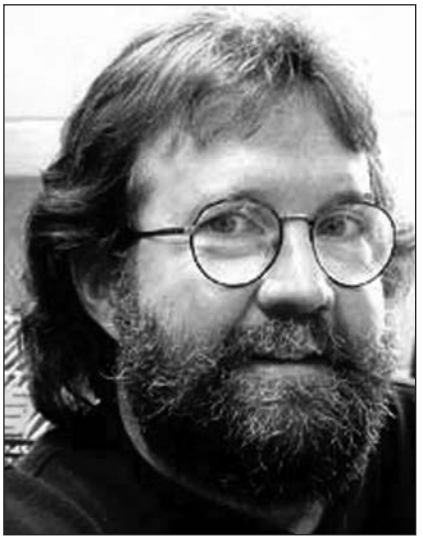
The outcry was immediate. Ben Goldacre, science writer for the *Guardian*, and Richard Dawkins led the way, leaping to Colquhoun's defense. Science blogs across England and America stormed with indignation and publicized the cause.

A few days later, on June 13, the University reversed itself, and issued a joint statement with Colquhoun. The professor's blog will return to UCL servers, after some small changes suggested by legal counsel. In the interim, Colquhoun's blog can be found at www.dcscience.net/improbable.html.

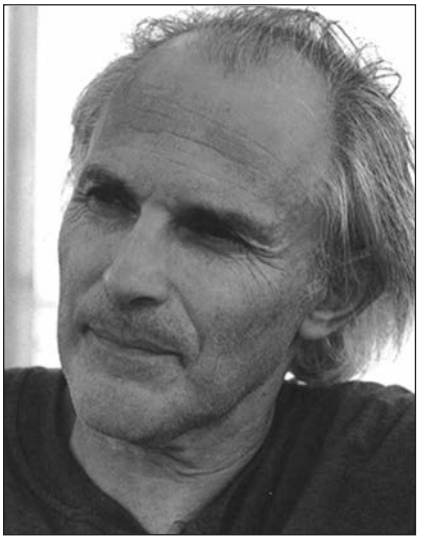
Observers, while applauding both the final outcome and the solidarity of the skeptical ranks, will find no small cause for disquiet—a peddler of pseudoscience, seeking to avoid scientific scrutiny, resorted to legal threats—and an institution of higher learning, seeking to avoid litigation, wavered in its duty to science, reason, and intellectual freedom.

—Mark Neunder

Mark Neunder is an associate professor of philosophy at Miami Dade College in Miami, Florida.


Sean B. Carroll

Barbara Forrest


Harry Kroto

building a Global Educational Outreach program to help educate and inspire the next generation of young people in science and the humanities.

* * *

The Executive Council also elected two young investigators as Committee for Skeptical Inquiry Scientific and Technical Consultants:

Chris Mooney, journalist, author, and Washington correspondent, *SEED* Magazine. Mooney works in Washington and specializes in reporting on the intersection of science and politics. He is the author of *The Republican War on Science* and *Storm World: Hurricanes, Politics, and the Battle over Global Warming*, published in June (see page 38). He is a SKEPTICAL INQUIRER contributing editor.

Matthew C. Nisbet, assistant professor, School of Communication, American University, Washington, D.C. Nisbet is a social scientist who studies the nature and impacts of strategic communication. He focuses on the intersection of science, media, and politics. His research frequently touches on the public perception and understanding of science and public issues of science, including fringe-science fields. His PhD is from Cornell University, and he has also taught at Ohio State University. His Science and the Media Web column appears at our Web site: www.csicop.org./scienceandmedia/.

Nisbet and Mooney frequently collaborate on papers, talks, and blogs. Nisbet was CSICOP's public-relations director from 1997 to 1999, and Mooney was a CSICOP intern, both at CSI headquarters in Amherst, New York.

—Kendrick Frazier

The Center for Inquiry/Transnational presents its Eleventh World Congress

"Scientific Inquiry and Human Development" Conference

October 13–15, 2007
Beijing, China

Hundreds of scientists and scholars from all over the world and all walks of life will convene. Topics to be discussed include: Scientific Inquiry and the World's Harmonious Development; Science and the Public; Scientific Method and Scientific Attitudes; Scientific Culture and Ethics; Science and Pseudoscience around the World. Speakers include: Paul Kurtz, Daniel C. Dennett, Jean-Claude Pecker, Mario Bunge, Lawrence M. Krauss, Nobel Laureates Murray Gell-Mann and Harry Kroto, and many more!

For more information, or to register online, please visit:
http://www.centerforinquiry.net/china/

IGNITE THE ADVENTURE

The NEW FUTURE Fund

"Knowledge is an unending adventure at the edge of uncertainty."

– Jacob Bronowski, scientific polymath

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The New Future Fund is an audacious, multiyear $26.265 million campaign to fund program needs, capital expansion, and endowment for the Committee for Skeptical Inquiry (CSI) and the Center for Inquiry.

In this new phase the focus turns to:

- Outreach and education: publishing, media relations, personal outreach, and more
- Influencing public policy through our new Center in the nation's capital
- Enhancing the Committee for the Scientific Examination of Religion (CSER)
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- Transnational Development: reaching beyond borders through the United Nations and direct activism around the globe

As always, the New Future Fund supports new and established programs, including Skeptical Inquirer and CSI's vital media and public education work. Because our work is so vitally important, please make your most generous gift today to support program expansion. By pledging a larger gift over a three-or four-year period, you may find a significant contribution more affordable. Our development staff stands ready to answer questions you may have about asset transfers, planned giving arrangements, and the like. All gifts are fully tax-deductible to the extent allowed by law.

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CFI CENTER FOR INQUIRY

CSI Committee for Skeptical Inquiry

Toni Van Pelt, Paul Kurtz, and Ron Lindsay (standing); Lawrence Krauss, David Helfland, and Nobel Laureate Paul Boyer (seated) introduced the Declaration in Defense of Science and Secularism at the inaugural press conference of the Center for Inquiry/Office of Public Policy in Washington, D.C.

Local leaders, campus activists, and students from around the world came together at CFI's 2006 Summer Session.

Latin American and U.S. skeptical activists met at the CFI-sponsored First Iberoamerican Conference on Critical Thinking in Peru.

The new Naturalism Research Project will more than double our library facilities and create a collegial setting for scholarly dialogue and research.

Evolution in the Limelight

In a crowded room on West 45th Street in Manhattan, a young high-school teacher is hauled before a judge to face criminal charges for teaching Darwin's theory of evolution to his students. During the ensuing trial, the lawyers for the prosecution and the defense wax poetic and trade rhetorical punches before a rapt audience. The judge, jury, and local community, all Bible-thumping fundamentalists, make clear their antievolutionist sympathies. The jury ultimately finds the hapless young man guilty as charged. And the process repeats itself endlessly and relentlessly, six days a week, sometimes twice in one day.

Far from a skeptic's worst nightmare, this scenario is an evolutionist's dream come true. The learned counsel for the defense is the inimitable veteran actor Christopher Plummer, while the lawyer for the prosecution is the venerated Brian Dennehy. The two lions of the stage, each of whom has won two Tony Awards for best leading actor, have joined forces for the most recent Broadway revival of Jerome Lawrence and Robert E. Lee's *Inherit the Wind*, the 1955 fictionalized retelling of the infamous Scopes "Monkey Trial" of 1925.

Over the last half-century, *Inherit the Wind* has undergone a number of famous and inspiring revivals. In 1960, Stanley Kramer made the play into a memorable film, starring Spencer Tracy as Henry Drummond, a character based on John Scopes's eloquent attorney, the agnostic Clarence Darrow; and Frederick March as Drummond's adversary, Matthew Harrison Brady, a character inspired by the three-time presidential candidate and outspoken creationist William Jennings Bryan. Poignant stage pairings of those roles in the past have included Paul Muni and Ed Begley (1955) and George C. Scott and Charles Durning (1996). The latest intelligent-design-creationism controversies in Kansas, as well as the recent real-life courtroom drama in Dover, Pennsylvania, make this year's revival particularly timely. What makes this production truly special, however, is the chance to see Plummer and Dennehy struggle in Darwinian stage competition, sparring, employing the full panoply of dramatic flourishes, and pushing each other's acting abilities to new heights in the process.

Christopher Plummer's performance is simply stunning: flawless and awe-inspiring, a sublime blend of gusto and gravitas. If at all possible, one might complain that Plummer performs his role almost *too* well. Several initial reviews complained that Brian Dennehy's performance lacked the flare and energy necessary to balance Plummer's impressive luminosity. By now, Dennehy has adjusted perfectly in response to these criticisms. At the performance we attended, Dennehy nearly upstaged Plummer with a magnificent performance, notable for its deep emotion and raw power. Also noteworthy is the strong performance of Denis O'Hare as E.K. Hornbeck, a character based on the cynical atheist news reporter H.L. Mencken. A large share of the play's many memorable quips are his. Speaking of Matthew Harrison Brady, Hornbeck snipes, "He's the only man I know who can strut sitting down."

The set design and atmospherics conveyed well the mood and feel of "Heavenly Hillsboro," the fictional small town inspired by Dayton, Tennessee. Before curtain, the audience was warmed up by a white Southern-gospel quartet perched atop the courtroom set. Although authentic and spirited, the singers didn't receive a rousing response until they dedicated a song to the lawyers in the audience (having failed to identify any Baptists). It was "Down by the Riverside," and the New Yorkers belted out the refrain, "I ain't gonna study war no more!" It felt a long way from the Bible Belt, or middle America, for that matter. An unscientific survey of the crowd revealed few tourists; the majority probably comprised local dramaphiles and regular subscribers to the theater.

Of course, *Inherit the Wind* has always been a long way from Dayton. In the play, the biology teacher, Bertram Cates, is portrayed as a martyr for science. In reality, Scopes was in no danger of being jailed. He was selected by the ACLU as a good test case for challenging the law. In a pivotal scene, Cates's girlfriend is denounced by her histrionically intolerant preacher father during a prayer meeting. This is all fiction. Scopes had no girlfriend, and Clarence Darrow reported being warmly received by the townspeople.

Christopher Plummer, left, and Brian Dennehy, right, perform the lead roles in Inherit the Wind.

It would be interesting to study the extent to which this celebrated work—originally penned as a metaphor for McCarthyism—has become a kind of folk history of the Scopes trial, in which fiction is unknowingly intermingled with fact. Then again, if *Inherit the Wind* is the rationalist's mythic, is that such a bad thing? Aren't lovers of science, like all lovers, to be excused for a few exaggerations of their beloved's virtues?

We rightly celebrate the triumph over intelligent-design creationism in Dover. But the attack on the teaching of evolution in America neither begins nor ends in a courtroom drama. It is being staged right now without fanfare on school boards and in science classrooms in towns you've never heard of. Creeping creationism has no easy legal cure. The U.S. Constitution alone cannot stop bad teachers from dropping Darwin from the curricula. Eternal citizen vigilance is required. While it may not make for good theater, this daily struggle for science is no less important.

—Austin Dacey and Derek Araujo

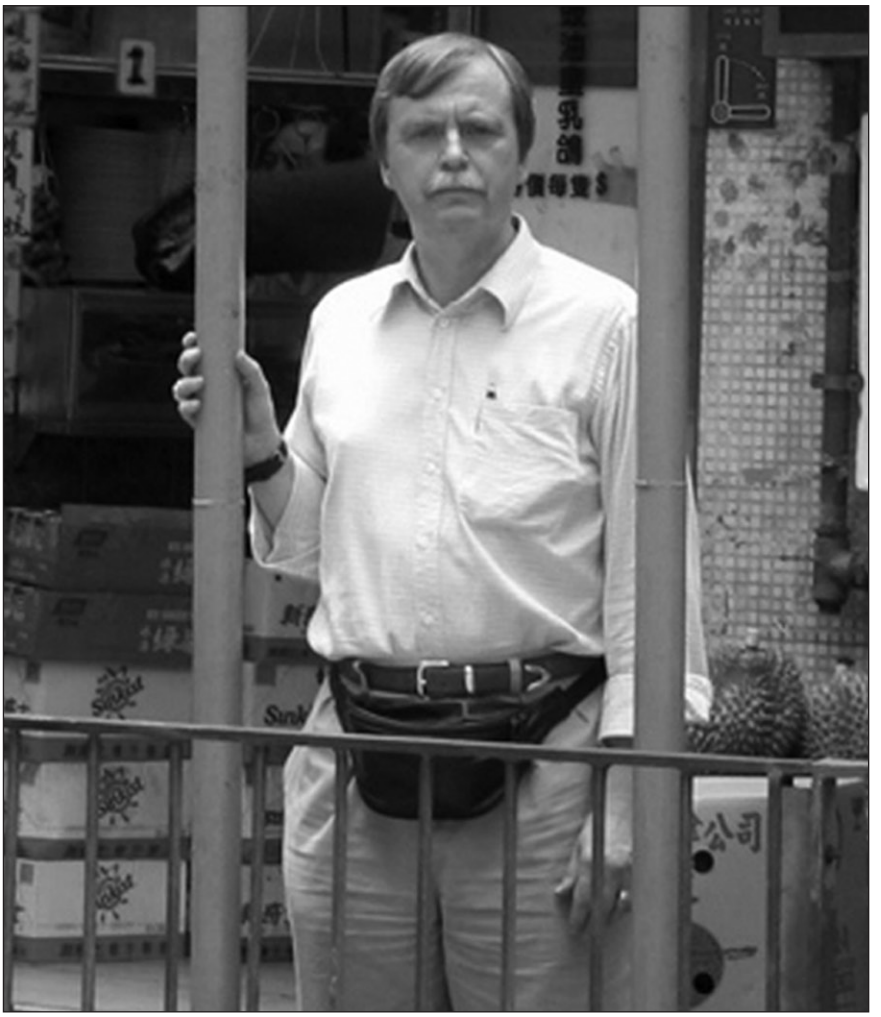
Skeptical Community Laments Loss of Barry Beyerstein, Psychologist, CSI Council Member

Barry Lane Beyerstein, a professor of psychology at Simon Fraser University in British Columbia and a longtime member of the Executive Council of the Committee for Skeptical Inquiry (CSI), died on June 25.

He died of a massive heart attack in his university office at the age of sixty.

An immense sadness is felt by all who knew him and have been influenced by his life and work. He was an exemplary and extraordinary human being.

Barry Beyerstein's contributions to the science, skeptic, and rationalist communities are unparalleled. He was a tireless defender of science, an activist who had been a staple in the media, television, newspapers, and public forums. He spent several decades volunteering his time and knowledge to CSI. He was a CSI Fellow, a member of CSI's Executive Council and the Editorial Board of the Skeptical Inquirer, and contributed countless articles to our many publications. He traveled and lectured all over the world (including China) for our organization and played an important role in our faculty lineup for the Center for Inquiry Institute. He will be especially missed at this summer's Skeptic's Toolbox in Eugene, Oregon, where he had served on a six-member faculty panel since its inception in 1989.



Barry Lane Beyerstein traveled to China with CFI in 1995.

Barry was best known for his work in psychology, especially the unconscious, the psychology of belief, neuropathology, brain states, and the like. He also contributed to the advancement of skepticism in the fields of graphology (he co-edited with his brother Dale *The Write Stuff: Evaluations of Graphology—The Study of Handwriting Analysis,* Prometheus Books, 1992), psychic phenomena, near-death experiences, alternative medicine, critical thinking, and more.

On a more personal note, Barry was an amazing man. He was kind and down to earth, had a wonderful sense of humor, and was definitely in touch with his inner child. He was an absolute joy to be around.

Barry leaves behind a beautiful and talented family who exhibit so many of the great qualities he possessed. His wife, Suzi, has played an important role at our events, and together they were an inspiration. Our love and deepest sympathies go out to his family: his wife, his daughter Lindsay, his son Loren, and his brother Dale. We will miss Barry each and every day, but we are honored to have known and worked with him.

The Center for Inquiry celebrated his life and work. A special tribute was organized for this year's Skeptic's Toolbox at the University of Oregon at Eugene, August 9–12. We also have the honor of creating an online archive of many of his papers and presentations on the CSI Web site.

—Amanda Chesworth and Barry Karr

Amanda Chesworth is the educational director and Barry Karr is the executive

You can make a lasting impact on the future of skepticism…

when you provide for the *Skeptical Inquirer*™ in your will.

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Your bequest to CSI, Inc., will help to provide for the future of skepticism as it helps to keep the Skeptical Inquirer financially secure. Depending on your tax situation, a charitable bequest to CSI may have little impact on the net size of your estate—or may even result in a greater amount being available to your beneficiaries.

We would be happy to work with you and your attorney in the development of a will or estate plan that meets your wishes. A variety of arrangements is possible, including: gifts of a fixed amount or a percentage of your estate; living trusts or gift annuities, which provide you with a lifetime income; or a contingent bequest that provides for the Skeptical Inquirer only if your primary beneficiaries do not survive you.

For more information, contact Barry Karr, Executive Director of CSI, at **716-636-1425**. All inquiries are held in the strictest confidence.

CSI
Committee for Skeptical Inquiry

CSI's Robert P. Balles Award Goes to *Guardian* 'Bad Science' Columnist Ben Goldacre

The Committee for Skeptical Inquiry has awarded its second Robert P. Balles Annual Prize in Critical Thinking to Ben Goldacre for his weekly column, "Bad Science," which appears in *The Guardian* (U.K.) newspaper.

Goldacre is an award-winning writer, broadcaster, and medical doctor who has written the column since 2003.

The Robert P. Balles Annual Prize in Critical Thinking is a $1,000 award given to the author of the published work that best exemplifies healthy skepticism, logical analysis, or empirical science. Each year, CSI will select the paper, article, book, or other publication that, in its judgment, has the greatest potential to create positive reader awareness of currently important scientific concerns.

CSI, the publisher of the Skeptical Inquirer, established the criteria for the prize, including use of the most parsimonious theory to fit data or to explain apparently preternatural phenomena.

This prize has been established through the generosity of Robert P. Balles, an associate member of CSI, and the Robert P. Balles Endowed Memorial Fund, a permanent endowment fund for the benefit of CSI.

Goldacre has won numerous awards, including "Best Freelancer" at the Medical Journalists Awards in 2006, the Healthwatch Award in 2006, "Best Feature" at the British Science Writers Awards twice, in 2003 and 2005, and the Royal Statistical Society's first Award for Statistical Excellence in Journalism in 2007.

He studied medicine at Magdalen College, Oxford, where he also edited *Isis*, the Oxford University magazine. He left in 1995 with a first: before going on to clinical medicine at University College London, he was a visiting researcher in cognitive neurosciences at the University of Milan, working on fMRI brain scans of language and executive function, and was also funded by the British Academy to do a master's degree in philosophy at King's College.

Ben Goldacre

Goldacre won the award for a body of work in 2006. It includes such columns as

> "Dyslexia 'cure' fails to pass the tests"
> "Bring me a God helmet, and bring it now"
> "Kick the habit with wacky wave energy"
> "Brain Gym exercises do pupils no favours"
> "Magnetic attraction? Shhh. It's a secret"

These and many more of his columns can be found at www.badscience.net/.

The first Balles Prize was awarded last year (SI, May/June 2006) to Ray Hyman, Joe Nickell, and Andrew Skolnick for their articles in the Skeptical Inquirer on "Testing the Girl with X-Ray Eyes" (May/June 2005). Nominations are now being accepted for 2007. Please send submissions to: Barry Karr, Executive Director, CSI, P.O. Box 703, Amherst, NY 14226-0703.

Quoteworthy

A Philistine Indifference

"The costs of an ignorance of science are not just practical ones like misbegotten policies, forgone cures, and a unilateral disarmament in national competitiveness. There is a moral cost as well. It is an astonishing fact about our species that we understand so much about the history of the universe, the forces that make it tick, the stuff it's made of, the origin of living things, and the machinery of life. A failure to nurture this knowledge shows a philistine indifference to the magnificent achievements humanity is capable of, like allowing a great work of art to molder in a warehouse."

—Steven Pinker, "The Known World," *The New York Times Book Review*, May 27, 2007 (reviewing Natalie Angier's *The Canon: A Whirligig Tour of the Beautiful Basics of Science*)

Only One Is Dogmatic

"The faithful believe that certain truths have been 'revealed.' The skeptics and secularists believe that truth is only to be sought by free inquiry and trial and error. Only one of those positions is dogmatic."

—Christopher Hitchens, "Bullshitting about Atheism," *Free Inquiry*, June/July 2007

Nature Is What It Is

"What excites me personally is how the discovery of Dark Energy [which scientists since 1998 have determined makes up two-thirds of the universe, yet we have no clue what it is] illustrates that science is not a set of beliefs that one constructs. Instead, scientists observe nature, then develop theories that describe their observations. Science is driven by nature itself, and nature gives us no choice. It is what it is."

—Meg Urry, chair, Department of Physics, Yale University, "The Secrets of Dark Energy," *Parade,* May 27, 2007

The Facts Don't Drive Opinions

"Global warming is another issue on which scientists continually fail to reach key segments of the public. The real inconvenient truth here is that scientists aren't doing a good job of packaging what they know. No matter how solid the science gets, there remain 'two Americas' on the subject: A strong majority of Republicans discount the science and the issue's urgency, while an overwhelming number of Democrats believe the opposite. Once again, the facts aren't driving opinions here. Instead, selective interpretations—delivered via fragmented media and resonating with the public's partisan prejudices—are winning out."

—Matthew C. Nisbet and Chris Mooney, "Blinded with Science: Thanks for the Facts. Now Sell Them," *The Washington Post*, April 15, 2007

Andrew Fraknoi Honored for Excellence in Astronomy Teaching

Andrew Fraknoi, an astronomy instructor at Foothill College in Los Altos Hills, California, and a Fellow of the Committee for Skeptical Inquiry, has been named the recipient of the 2007 Richard H. Emmons Award for Excellence in College Astronomy Teaching by the Astronomical Society of the Pacific (ASP). Fraknoi will receive the award at the ASP's 2007 annual meeting and conference in Chicago in September.

"I'm delighted that there now exists a national award for teaching astronomy to college non-science majors, and that I am fortunate enough to be the second recipient of this prize," Fraknoi said. "So often what happens behind the doors of our nation's college classrooms is left only to the public's imagination. Yet, it is behind those doors that the crucial transformation of our students from kids to adults and from passive to active learners happens. My life's missions have always been to share the excitement of astronomy with those who are not particularly science-oriented and foster in my students a lifelong interest in the wonders of the universe."

Fraknoi is a longtime community-college instructor, textbook author, and prolific writer and speaker. He has been a member of the Foothill College faculty and chairman of the college's astronomy department since 1992. He is the lead author of *Voyages through the Universe*, one of the foremost introductory astronomy textbooks in the country, and has written or edited more than a dozen books on astronomy and astronomy education. ☒

Andrew Fraknoi (Photo by Seth Shostak)

The Loch Ness Critter

JOE NICKELL

The Loch Ness "Monster," affectionately dubbed "Nessie," has been captured—on video. A lab technician named Gordon Holmes (no relation to Sherlock) caught on camera a "jet black thing, about forty-five feet long, moving fairly fast in the water"—a speed he estimated as about six miles per hour (McConville 2007). He claims to have taken the video from the shore of the loch on Saturday, May 26.

On Friday, June 1, I was asked by CNN International and again by CNN's *Paula Zahn Now* to view the Holmes footage and offer an opinion. I appeared live on the latter show to debate Loren Coleman, whom Paula aptly introduced as a cryptozoologist, which means, she said, "he studies creatures that may not exist" (Zahn 2007).

In typical mystery-mongering fashion, Coleman said of the video ". . . it's not definitive proof of Nessie until we have a body, but it certainly raises a lot of questions and is quite exciting." He found the footage "compelling."

I stated that, in any context other than Loch Ness, the video would be seen as probably depicting a beaver or an otter, adding that "in fact, the large European otter, *Lutra lutra*, is in the loch and is responsible for many sightings." I pointed out that if a genuine monster existed, a sizable breeding population would be necessary for the creature to be reproduced over the centuries, in which case, a carcass or skeleton should eventually show up. I also mentioned that the BBC scanned the lake with sonar from end to end and side to side in 2003 without finding a leviathan (see Nickell 2006, 23).

Coleman replied that "Joe knows very well that it's six miles to the ocean, that these animals have been seen on land and crossing land. If we're talking about a breeding population, they could be breeding in the oceans, and it's not necessarily a land-locked prehistoric monster like the straw-man arguments want to give us."

"Yes, true, true," I responded, "but

Gordon Holmes caught on camera a "jet black thing, about forty-five feet long, moving fairly fast in the water."

before we conjure up such an elaborate explanation of them breeding outside and then swimming up the River Ness and getting into the loch and then leaving again—before we do all that, we need to have some evidence that there is something to explain. And, so far, the otters—in fact, some of the best sightings around the world of lake monsters are probably otters swimming in a line, creating this illusion of a large, maybe seventy-foot-long, undulating creature. They're just these cute little critters that we all love, and they're impersonating the monster."

Subsequently, Coleman posted on the *Cryptomundo* Web site (www.cryptomundo.com) an article that was less a rebuttal than a caricature of my position. He titled it "Otter Nonsense," but he otter do better. He says I seemed "to convey the sense that *all* Lake Monster reports around the world could be explained as being otters" [emphasis added], whereas I used the phrase "some of the best." In *Lake Monster Mysteries* (Radford and Nickell 2006, 117–118)—for which Coleman wrote the foreword—I flatly state that "Of course, not all lake monster sightings are of otters," and I detail many other culprits, again arguing only that otters "may be responsible for some of the best sightings"—whether singly or otherwise.

Misrepresentations aside, I was able to study the Holmes Loch Ness video more thoroughly. Tom Flynn, media director at the Center for Inquiry and a longtime analyst of "paranormal" photos and video, explained the process as follows:

> We obtained a clip of Internet video at approximately one-half of standard NTSC television resolution (320 x 256 pixels). The segment including video of the supposed creature was 24 seconds, 22 frames in length. This video was then up-rezzed to standard NTSC (640 x 480 pixels), contrast-enhanced, and window-dubbed (marked frame-by-frame with time code for purposes of analysis).

Flynn concludes:

> The final shot in the sequence begins as a moderately tight shot of the supposed creature, then zooms in to an extremely tight shot. A repetitive motion is visible at the leftmost, presumably forward end of the object: a small structure at the tip of the object appears to undulate up and down, at its lowest point vanishing beneath the water surface. This motion recurs with a period of about two-thirds of a second. Three complete cycles of this

Joe Nickell is CSI's Senior Research Fellow and author of numerous investigative books, including Looking for a Miracle. *His Web site is at www.joenickell.com.*

undulating motion are visible at the end of the clip. The first cycle is harder to track because the camera is still zooming in; the second and third cycles occur after the zoom-in has stopped and can be seen rather clearly. [Key frames of the second movement cycle appear as figures 1 through 4.] It has the appearance of a "head" that bobs up and down while a trailing "body portion" remains at a fairly constant level. The rapid cycle time (greater than once per second) would suggest a relatively small creature.

In brief, the locomotion appears consistent with that of an otter. So do its size and speed. While some sources say Holmes estimated the "monster" as forty-five feet long (McConville 2007), others quote him as saying it was only about four to six feet long ("Nessie" 2007), consistent with the length—up to about four and a half feet (according to *Encyclopaedia Britannica* 1978)—of the large European otter. Sources agree Holmes estimated the creature's speed at approximately six miles per hour, and an otter can swim even faster (Pound 2007), leaving a long wake like that recorded on the video. In fact, otters "are among the fastest swimmers of all animals" (*Collier's Encyclopedia* 1993). (They also often travel long distances on land—Coleman take note—and "the major threat to otters today is being run over on the roads" [European otter 2007].) In water, the European otter usually appears dark, has an elongated, contortionistic form, and is easily misperceived as a monster, according to Ronald Binns in his *The Loch Ness Mystery Solved* (1984, 187–192).

But, as Binns also notes (1984, 187), "The suggestion that otters might account for sightings of the monster usually evokes great indignation and derision among believers." Loren Coleman is no exception, stating that "Otters are hardly in vogue any more. Even Bernard Heuvelmans' theory of the 'super-otters,' as a type of Sea Serpent, has falling [*sic*] from favor," (Coleman 2007a).[1]

Figure 1. The object is traveling right to left. Seen here, the "body portion" remains at relatively constant height.

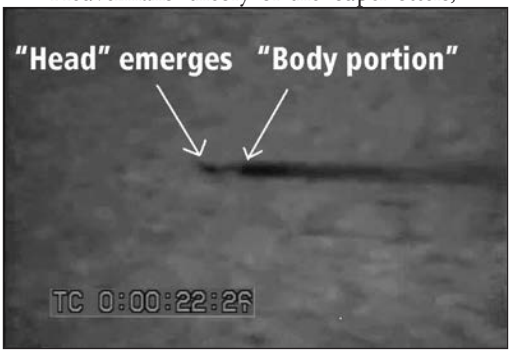

Figure 2. Another part of the object, not visible in figure 1, emerges to the left of the "body portion." This may be the supposed creature's head rising out of the water.

Figure 3. The "head" lifts to maximum extension.

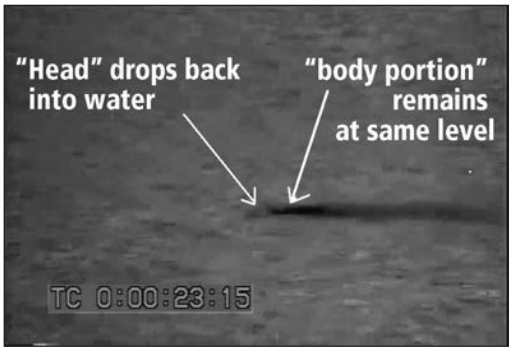

Figure 4. The "head" drops back into the water with visible disturbance or splash, after which, the cycle repeats and the clip ends.

Super-otters, indeed. Ordinary otters—who tend to live in the immediate proximity of reputed lake and river monsters (Nickell 2007)—are sufficient to fool many cryptozoologists and their credulous followers.

Acknowledgements

In addition to Tom Flynn, I am grateful to Henry Huber, Barry Karr, and especially Tim Binga and Julia Lavarnway for their generous assistance, as well as my wife, Diana Harris.

Note

1. Noting that Gordon Holmes had previously claimed to film fairies and "is a bit eccentric," Coleman (2007b) says, "Frankly, I think this all throws the new Nessie footage in some doubt, for, after all, what was seen and filmed might just be a small eel, a porpoising otter, or an underweight seal." Some sources acknowledge the uncertainty that the video was necessarily made at Loch Ness.

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Santa Fe 'Courthouse Ghost' Mystery Solved

BENJAMIN RADFORD

A mysterious, glowing, white blob was captured on videotape June 15, 2007, by a security camera at a courthouse in Santa Fe, New Mexico. While the court personnel who first saw the baffling image didn't know what to make of it, others soon offered their own explanations. As might be expected, that it had been a ghost was among the most popular—possibly of a man killed there in 1985.

The "ghost video" became a nationwide hit and has been viewed over 85,000 times on the YouTube Web site (see www.youtube.com/watch?v=hWHRnjFCgd4&NR=1). What started as a local curiosity soon spread internationally, as CBS News, ABC News, and newspapers across the country from *The Boston Globe* to the *San Francisco Chronicle* carried the story of the "courthouse ghost." Friends and bloggers shared their opinions about the mysterious object; one Santa Fe local asked if psychics had yet been asked to communicate with the restless spirit. Other theories included a video glitch, a hoax, a spider, and a reflection from a passing bicyclist or car.

I was asked by a reporter from the *Santa Fe New Mexican* newspaper to investigate the video. I traveled to Santa Fe to see the original surveillance tape and conducted a series of experiments over the course of two days. After some analysis and a series of measurements, I eliminated some of the more outlandish theories and focused on two of the most likely suspects: a floating cottonwood seed or an insect. There was plenty of speculation, but actually proving that a given suspect could create the "ghost" image is a whole different matter.

Figure 1. The author conducts an experiment to determine the origin of the Santa Fe Courthouse Ghost.

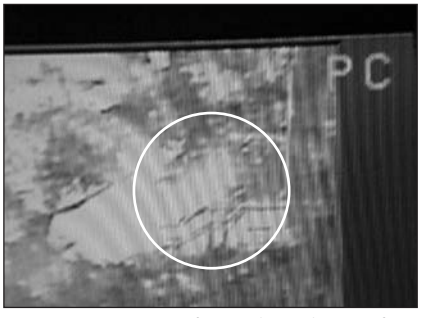

Figure 2. A still image of a bug (circled), taken from the District Courthouse's security camera, duplicating the original "ghost."

I blew cottonwood seed into the air near the camera to see how closely the resulting image matched the ghost. A review of the tape showed only mixed results: while the size and shape was roughly correct, the color and movement did not match. The second set of experiments involved the bug hypothesis. While a crawling insect had been offered as an explanation, it wasn't clear that a bug would indeed create that image. The next morning, I returned to the courthouse and carefully placed ladybugs and other insects on top of the video camera (see figure 1). After a few false starts, at 7:26 A.M. (within minutes of the time of the original "mystery" videotaping), I coaxed the "ghost" across the camera lens (see figure 2). Using the insects, I duplicated the ghost image in every respect, including size, shape, color, and movement. The deputies at courthouse agreed; "You got it," Deputy John Lucero told me. "I'm convinced it was a bug."

The mystery was solved: the Santa Fe Courthouse Ghost was a small insect or spider. The only real mystery is why the ghost label stuck, though the word *ghost* often is simply a catch-all term for something someone can't explain or doesn't understand. Frequently, these mysteries explode into the pop culture and make a splash, with little follow-up or resolution (while the original story appeared twice on the front page of the *New Mexican*, the definitive debunking was noted in one short sidebar in the C section).

While the investigation was a textbook success, there was only one thing I wished I'd done differently: before I started, I should have hired some local psychics to contact the ghostly spirit and tell us why it was haunting the courthouse. The answers would have been fascinating.

Benjamin Radford is an investigator with the Committee for Skeptical Inquiry and the managing editor of the SKEPTICAL INQUIRER. *His latest book, coauthored with Joe Nickell, is* Lake Monster Mysteries: Investigating the World's Most Elusive Creatures.

Mythic Creatures, Bigger than Life

EDWARD SUMMER

Living as we do in a sea of words lit by a backdrop of television and the Internet's endless flow of two-dimensional images, solid, factual "experiences" become more and more difficult to obtain.

The words that you are reading provide a fine example. Here is a string of abstractions that, I hope, conjure images and thoughts and ideas in your brain as your eyes scan along little black-and-white symbols.

Indeed, the very publication you hold in your hands inadvertently embodies the "dryness" of much modern educational experience: no matter how high the ideals of a publication, it is no substitute for getting wet in a raging river. Language is not water. Philosophers who don't dig real wells die of thirst.

Enter Mythic Creatures: Dragons, Unicorns & Mermaids. From May 26, 2007, through January 6, 2008, the American Museum of Natural History (AMNH) in New York City will host the exhibit. It will then move on to the Field Museum (Chicago), The Canadian Museum of Civilization (Gatineau-Ottawa), the Australian National Maritime Museum (Sydney), and the Fernbank Museum of Natural History (Atlanta).

The gryphon (left) may have been a reimagining of fossil remains of protoceratops, embellished with parts of lions, eagles, and other animals that may have been familiar to those who found the fossils. The unicorn (right) sports what may well be a narwhal tusk. (© D. Finnin/AMNH)

Inspired by Adrienne Mayor's seminal book, *The First Fossil Hunters: Paleontology in Greek and Roman Times* (Princeton University Press, 2000), this entertaining and enlightening exhibit manages to have it more than both ways. Here's a three-dimensional encyclopedia of the world's most titillating and persistent myths, accompanied by some wondrous detective work that promises to pin down the truth with as much fascination and delight as the excitement of the imaginary stories that the world's diverse peoples have told for centuries.

Mayor wanted us to know that mythology was not fabricated from whole cloth: ancient peoples (and some modern ones as well) observed real objects and events and interpreted them within the constraints of their experience, intelligence, and worldviews to form often fantastic and phantasmagoric amalgams of imagination and fact. A large group of scientists at the AMNH took nearly four years to assemble examples of both the underlying realities and the super-real imaginary creatures.

Greeted at the entrance by a life-size dragon, the lucky (or hapless) visitor sweeps past a believe-it-or-not array of beasts that would make Ripley jealous: dragons, Quetzalcoatl, the kraken (look out for those tentacles!), mermaids (Mama Wata, Lasiren, Sedna, Yawkyawk), a griffin, yeti, unicorn, phoenix, sphinx, *Aepyornis* (extinct and mythic in the same breath), tengu, Garuda, nagas, and Pegasus. We've read about all of them, but here they are, life-size and in rare, finely wrought items of folk art, sculpture, and fossil.

Gryphons, or griffins, and cyclopes are sterling and striking examples. The fossil remains of a dinosaur called *Protoceratops* were found in profusion 2,000 years ago by Scythian miners near many gold deposits in the Gobi desert. A gryphon statuette from Egypt, ca. 150 C.E., incorporates the literal fossil features of this striking and unique dinosaur into the body of a lion with the wings of an eagle and associates this new and imaginary animal with gold, making it the supernatural "guardian" of hidden riches. It is understandable that uneducated miners would concoct a beast in the image of animals they

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already knew by fabricating a reasonable variation on the bits and pieces of bones and memories into this new beast: the gryphon. A modern scientist would recognize the fossils for what they are, based on centuries of research and the accrual of specimens that, in a formal way, rule out the actual existence of the mythic beast. Yet it is a convincing-enough model of a kind of animal that *could* plausibly exist. Historically, the refinement and interpretation of evidence constitute the ongoing process of scientific discovery, and here it is, before our astonished eyes.

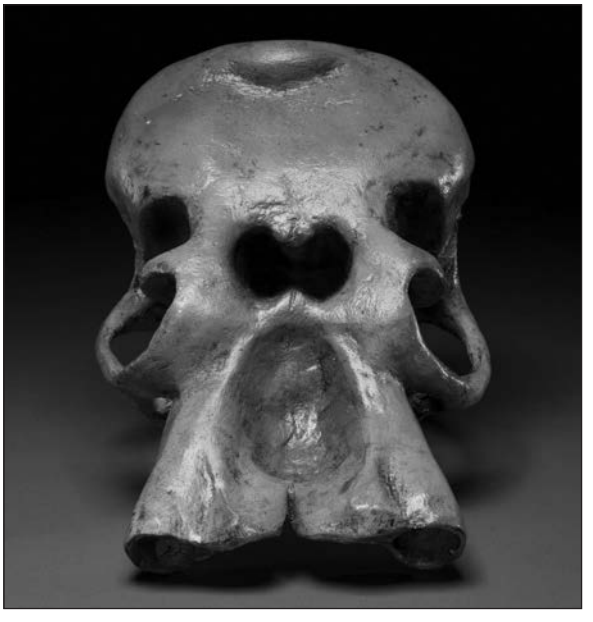
The cyclops is another of the more dramatic and clear examples of a mythical beast. Viewed straight on, the fossil skulls of dwarf elephants found in ancient Greece look like the head of a giant man with a single eye socket in the center of his forehead. Actually, the elephant's eye sockets are to the side, and the central hole is an air passageway, but, to the untrained eye that accidentally dug up this mysterious object, it is none other than the eye of a giant. With not much imagination, this new monster was fleshed out and became a character in countless stories, including Homer's *The Odyssey*.

The correspondences are both amazing and understandable, coming as they do from ages before television, books, the Internet, and the myriad audio-visual research aids that the modern scientist and casual observer have at their disposal. Long, white Narwhal tusks become the horns of unicorns; *Gigantopithecus blackaii,* a huge protohuman of prehistoric Asia, left skeletal remains all over the region for nearly a million years, undoubtedly forming the foundation of some of the belief in Yeti and other, similar legendary creatures.

While some monsters, such as the chupacabra, have yet to be identified from anything besides the accounts of terrified farmers in Latin America, it's not at all hard to see where the majority of the world's storehouse of mythical and legendary beasts may have originated.

A highlight of the exhibit is what may be, in fact, P.T. Barnum's actual, original "FeeJee Mermaid." Long a stable of carnivals and sideshows, the FeeJee (a showman's colorful corruption of Fiji) mermaid is a patently phony piece of "art" gaffed together from monkey skulls, animal claws, and, perhaps, a dried fish body. When skillfully constructed, they are tantalizingly real and provocative, especially when viewed briefly and dimly behind the glass of a dark and fingerprinted showcase in the corner of a tent in some traveling show. Long thought to be lost in a fire, Barnum's FeeJee mermaid, exhibited at his museum around 1842 to much awe and acclaim, may well have been the one tucked away unlabelled in a box in Harvard's Peabody Museum of Archaeology and Ethnology's collection of odds and ends. It's exhibited here with no provenance, only the titillating implication that this might be the *sine qua non* of FeeJee Mermaids. However, the link between natural creatures like oarfish, ribbon fish, squids, and manatees to the hippocampus and mermaid is clearly and convincingly demonstrated with drawings, historic art and books, and a limited but effective number of videos placed throughout the exhibit on flat-panel monitors.

The afficionado of the weird and strange will thrill to a once-in-a-lifetime array of scientific and fabled wonders. Robert Ripley would have been proud.



Dwarf elephant skull: the myth of the cyclops may have been fueled by fossil discoveries. Ancient Greeks who uncovered the skulls of dwarf elephants on Mediterranean islands may have mistaken the central nasal cavity—where the trunk was attached—for a single eye socket, that suggested one-eyed giants had once roamed the land. (© D. Finnin/AMNH)

The afficionado of the weird and strange will thrill to a once-in-a-lifetime array of scientific and fabled wonders. Robert Ripley would have been proud, and he's been done one better in the care with which the artifacts are described and interpreted. Lucky is the child taken here young enough to gape in awe at the stuff of dreams, life-size and up-close, who—simultaneously—learns

'John of God': Healings by Entities?

Known as "John of God," a Brazilian faith healer claims spirits take control of his body to enable him to perform surgeries without anesthesia and other healing procedures. The spiritual center he founded, located in the little town of Abadiania in Brazil's remote central highlands, has been dubbed "the Lourdes of South America" ("Controversial" 2006), while he himself has been called a charlatan and worse ("Is" 2005).

First alerted by a CNN producer to a John of God healing service in Atlanta, I determined to go undercover to get a close look at what was transpiring. I worked with National Geographic Television and Film on a segment for their *Is It Real?* series program, "Miracle Cures," which included an analysis of the John of God phenomenon.

Figure 1. The author, adopting the persona of a pilgrim seeking a miracle cure, attends a "John of God" healing service. Dressing in white was a requisite of the event. (Photos from the author's file)

John of God

Known in his native Portuguese as *João de Deus*—"John of God"—João Teixeira de Faria was born in 1942 to poor parents. He grew up unable to stay in school or hold a job. At sixteen, he reportedly discovered his miraculous ability when, in a vision, a woman directed him to a nearby church. There, although he maintains he does not remember what happened, having been entranced, he allegedly performed a miraculous healing.

He thus began a career that impresses the credulous. Claiming to be a medium (one who communicates with spirits of the dead), he insists he is guided by more than thirty entities—although, curiously, João speaks only Portuguese, regardless of which entity is possessing him at a given time. King Solomon was his first entity. Others followed, including Ignatius Loyola, the Spanish noble who founded the Jesuit order in 1540; João's center is named for him: Casa de Dom Inácio de Loyola. Oswaldo Cruz, a physician who helped eradicate yellow fever, is another alleged entity, along with other past healers, in a sort of spiritist pantheon ("Controversial" 2006; "Is" 2005).

Spiritism is essentially spiritualism, a belief that one can communicate with spirits, but with the added conviction that spirits repeatedly reincarnate in a progression toward enlightenment. In Brazil, which is steeped in superstition and has a climate of belief in African spirits, spiritism has become a powerful religious movement, overlayed onto Catholicism. It may involve mediumistic searches for past lives and even so-called "psychic surgery" (Bragdon 2002, 14–20; Guiley 2000, 360–362).

Supposedly, psychic surgeons open the body paranormally—without surgical instruments or anesthetic—and heal diseases by manipulating vital organs. Typically, they have involved fraudulent practices including sleight of hand. For instance, "tumors" have proved to be pieces of chicken intestines and blood that of a cow (Nickell 1998, 159–162).

John of God, however—styled "João-in-Entity" when supposedly possessed—has a different style. He per-

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forms dubious "surgeries" that are either "visible" or "invisible." The former may involve twisting forceps up a person's nostrils or using a knife to scrape an eyeball or slice open a fleshy abdomen—all without anesthesia. According to a pro-João book, "In over thirty-five years of the Entity's surgery, it has been extremely rare for there to be any infections" (Bragdon 2002, 11).

With "invisible surgery," the entity *du jour* gives a prayer, after which thousands of "healing entities" busy themselves, allegedly, by operating on an organ, revitalizing a muscle, or otherwise "simultaneously attending to the problems of the people in the room" (Bragdon 2002, 11). Augmenting the sessions are encouragements to meditate, drink water blessed by the entities, and take prescribed herbal remedies.

Figure 2. "John of God" (right)—supposedly possessed by a spirit entity—directs treatments for the afflicted. Seated in the background is the author, ready to undergo an "invisible surgery."

Investigation

I had already obtained a ticket to the John of God event in Atlanta when I was contacted by National Geographic Television. We then worked together on an investigation that shed new light on the Brazilian's claims.

Shrewdly, João's entities avoided performing "visible surgeries" in Atlanta, where he might have been arrested. I was chosen for an "invisible" procedure as I hobbled by with a cane, wearing the requisite white outfit that, I was told, "helps maintain a higher vibrational frequency" ("John" 2006a; 2006b). I also wore a minor disguise since frequent media appearances have made me more recognizable (see figures 1 and 2).

As I would discover, João is an unlikely miracle worker. A grade-school dropout, he was, reports an admirer, "forced to live as a wanderer, traveling from city to city healing the sick and living from their donations of food" (Pellegrino-Estrich 1995). Because, in Brazil, it is illegal to practice medicine without a license, he has been charged and fined—even jailed briefly. A district attorney who investigated him has reported that João sent her—indirectly, through a relative—death threats. John of God denies that, along with an accusation that he took advantage of one woman who had come to him for healing. "There is a lot of jealousy. People talk," he says defensively. "What dictates is the conscience toward God." Noting his apparent wealth, some critics say his "healings" are merely a front to make him a rich man ("Is" 2005).

Certainly, his procedures are a sham. The twisting of forceps up a pilgrim's nose is an old circus and carnival sideshow stunt. The feat depends on the fact that, unknown to many people, there is a sinus cavity that extends horizontally from the nostrils over the roof of the mouth.

Certainly, his procedures are a sham. The twisting of forceps up a pilgrim's nose is an old circus and carnival sideshow stunt, explained in my book *Secrets of the Sideshows* (Nickell 2005, 238–241). Looking far more tortuous than it is, the feat depends on the fact that, unknown to many people, there is a sinus cavity that extends horizontally from the nostrils over the roof of the mouth to a surprising distance—enough to accommodate a spike, icepick, or other implement used in the "Human Blockhead" act.

At my instigation, National Geographic filmed a performance of such an act at the Washington, D.C., showbar Palace of Wonders, operated by carny impresario (and friend) James Taylor. Our blockhead was "Swami Yomahmi," a.k.a. Stephon Walker, whom I introduced with my best carny-sideshow spiel. Walker even cranked a rotating drill bit into his nose. He also used a blunt knife to scrape the white part of his eyeball and acknowledged that such stunts look more risky than they are.

A surgeon who commented on John of God's incisions stated that they were superficial (little more than skin deep, apparently) and would not be expected either to bleed very much or even to

cause much initial pain. The same is true of scraping the white of the eye or inserting something into the nasal cavity ("Controversial" 2006). Physicians affiliated with the SKEPTICAL INQUIRER voiced similar opinions. The brief nasal procedure occasionally leaves someone's nose bleeding, but his or her body's own healing mechanisms will no doubt repair the minor injury. The bottom line regarding the procedures is that they are pseudosurgeries that have no objective medical benefit other than the well-known placebo effect.

Furthermore, the "holy water" that "João-in-Entity" blesses and that supposedly helps effect cures is ordinary water. I provided a specially labeled bottle I had purchased in Atlanta, and National Geographic had it tested at a major D.C.-area facility, the Washington Suburban Sanitation Commission. It was found to have no unusual properties and to be entirely unremarkable ("Miracle" 2006).[1]

As to João-in-Entity's herbal remedies, actually only a single herb is prescribed, but those seeking aid are told that the entities are able to use it to help cure a wide variety of ailments ("Miracle Cures" 2006). The herb is one of the many varieties of *passionflower*, a mystical plant associated with Jesus' crucifixion, and it has been used since ancient times as a "sedative, nervine and antispasmodic." Herbalists say it soothes the nervous system and produces restful sleep that brightens one's outlook (Lucas 1972, 128–129). Small wonder it would be the drug of choice for a "healing" center to distribute widely.

Many people offer testimonials as to the beneficial effects they have supposedly received at the hands of John of God. In fact, however, the successes attributed to the entities may be nothing more than what occurs at other alleged miracle sites, like Lourdes, where the vast majority of supplicants remain uncured. Since such "healings" are typically held to be miraculous because they are "medically inexplicable," claimants are engaging in the logical fallacy of "arguing from ignorance"—that is, drawing a conclusion from a lack of knowledge. Touted healings may actually be attributable to such factors as misdiagnosis, spontaneous remission, psychosomatic conditions, prior medical treatment, the body's own healing power, and other effects (Nickell 1998, 133–137).

Matthew Ireland had a type of brain tumor that was fast-growing and inoperable. Subsequent MRI testing did show that the tumor mass was not gone as the entity had claimed.

Consider, for example, the case of Matthew Ireland, a pilgrim from Guilford, Vermont, whose doctor told him he had a type of brain tumor that was fast-growing and inoperable. After two years of radiation treatments and chemotherapy, Ireland made three visits to John of God. Subsequent MRI testing did show that the tumor mass had shrunk by fifty percent, but it was not gone as the entity had claimed. Ireland's former oncologist attributes the partial success to the aggressive radiation treatment and concedes it is possible that the specific type of tumor may have been misdiagnosed ("Miracle" 2006; "Is" 2005).

Often, at healing services like those of John of God in Brazil, pilgrims' emotions may trigger the release of endorphins, brain-produced substances that reduce sensitivity to pain. They may thus believe and act as if they have been miraculously healed—even throwing away their crutches—whereas later investigation reveals their situation to be as bad, or worse, than before (Nickell 1998, 136). However, I did note that, at the Atlanta John of God event, those who came with walkers, crutches, and wheelchairs *left with them*. Sadly, the entities had not taken away their afflictions, only their money.

Acknowledgments

I am grateful to my wife, Diana Harris, not only for her forbearance but also her direct assistance in this project. I am also grateful to Isham Randolph and others from National Geographic Television and Film for their professional work, as well as to Timothy Binga, the director of CFI Libraries, and Lauren Becker, then CFI's assistant director of communications, for research assistance.

Note

1. At the event I attended in Atlanta on April 4, 2006, at the Renaissance Waverly Hotel, a staffer told me the water could be replenished by refilling the bottle when the level gets low, using ordinary tap water—the original water energizing the newly added.

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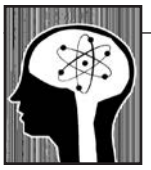

The Trouble with Memetics

A meme, according to the by-now-standard dictionary definition, is "an element of a culture or system of behavior that may be considered to be passed from one individual to another by nongenetic means, especially imitation." The idea (a meme itself?) was first introduced by Richard Dawkins in his 1976 book, *The Selfish Gene*. Dawkins's intention was to make the points that evolution by natural selection is not limited to genes and that it isn't an accident of life on Earth. Rather, Darwinian principles are universal, and they apply to whatever other system features the basic characteristics of heritable variation in attributes affecting fitness.

But we only know of one such system, life on Earth, and that system is inextricably dependent on genes. Moreover, life on our planet probably evolved only once, and it isn't at all clear that such evolution was inevitable or even highly probable. So how could Dawkins make the argument that Darwinian principles are universal (without waiting for the discovery of life on Mars)? Enter memetics. The basic concept is that there is, in fact, at least one other class of "replicators" subjected to natural selection: memes. Derived from direct analogy with genes (and with a nice Greek root in the word *mimema*, which means "that which is imitated"), they indicate that ideas, or mental constructs, can be thought of as replicators competing for space inside human minds.

Memes have caught on in a limited way. The new term has made it into dictionaries, and a small number of books and even a dedicated technical journal have discussed all things memetic. And yet there is quite a bit that is rather unconvincing about the whole idea. To begin with, unlike the case of genes, there doesn't seem to be any distinction between memes themselves and the phenotypes they produce. Genes in some sense "encode" proteins, and proteins have a variety of effects that indirectly contribute to the fitness of the organism carrying those genes. In Dawkins's own terms, there is a distinction between "replicators" (the genes) and "interactors" (the organisms themselves).

But, in the case of memes, the replicating "unit," for example, an annoying tune that gets into your head, forcing you to whistle it, and thereby gets stuck into somebody else's head, is both replicator and interactor. This isn't necessarily a fatal problem, but it begins to point toward a disanalogy between genes and memes. And it gets worse.

The second problem with memes is that nobody seems to know what their physical basis is. Genes are—roughly speaking—pieces of nucleic acids (DNA or RNA), with known physical-chemical characteristics. But memes can be instantiated equally well inside someone's mind (where presumably they correspond to specific patterns of neuronal firings), on a computer's hard drive, in a book, or on an iPod. While it is true that, for decades after Gregor Mendel proposed the idea of genes, biologists didn't know what they were made of either, the likelihood of pinpointing a physical makeup for memes is less likely because they seem to be a sort of "diffuse" entity that can have many physical incarnations. Again, this is disanalogous with genes.

As a result of this ambiguity, it is pretty much impossible to tell what constitutes a meme. The typical examples in literature vary from the above-mentioned annoying tune to religion. The latter kind of meme is often referred to as a "meme complex," or "memeplex." This is again supposed to be analogous to the fact that sometimes groups of genes with a common evolutionary history are found physically linked on a chromosome to form gene complexes, with the complex (rather than individual) genes being the target of natural selection. But the idea works for genes because of their identifiable and stable physical nature. In the case of memes, there is no way to tell what constitutes a memeplex, other than the arbitrary interest of the researcher.

As if all of the above were not cause for a pause, there is a further, more crucial problem with the idea of memes: it is not predictive. Philosopher Karl Popper once said that evolutionary theory is not a scientific theory but rather a "metaphysical research program" (see "Thinking about Science," September/October 2004). What he meant was that it is not possible to falsify or test the theory because it is

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based on a circular definition: it says that natural selection favors the survival (and reproduction) of the fittest, but it then turns around and defines the fittest as those who survive (and reproduce). Creationists are fond of this statement by Popper, without realizing that the philosopher himself eventually admitted that he was wrong. Popper had misunderstood the nature of evolutionary theory, not having realized that there are independent ways of making predictions about the fitness of organisms (based on our understanding of the functional ecology of their characteristics). This breaks the circle and makes evolutionary theory a standard scientific theory.

But Popper's objection remains valid for memetics: the only way to tell which memes are going to be successful, which tunes are going to stick in your mind, or which religions are going to become popular is by waiting and seeing what happens. That is, memeticists completely lack a functional ecological theory of memes. Without it, the whole enterprise is scientifically empty.

Indeed, memetics—at least for now—doesn't seem to add anything to the standard view of gene-culture co-evolution that was developed well before Dawkins put down his ideas in *The Selfish Gene*. Ideas clearly do evolve, and there is in fact a somewhat undeniable analogy between memes and the evolution of genes. But we don't need to push that analogy too far, and we certainly don't need a whole new vocabulary to make sense of it.

Finally, despite the questionability of memetics, Dawkins's claim about universal Darwinism is probably correct, and we do have a nonbiological example to study at our leisure: computer scientists have discovered the idea of "genetic" algorithms, i.e., computer programs that can literally evolve by mutation and selection, perfectly mimicking the biological process. Indeed, researchers in this field have independently rediscovered many of the laws and generalizations that population geneticists have produced ever since the beginning of modern genetics at the dawn of the twentieth century.

Darwinism, therefore, does seem to be a universal property of certain kinds of systems. Memes, on the other hand, have a long way to go before becoming a sufficiently fecund concept for scientists to work with. ☒

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The Man Who Fooled Edison . . . but Not Houdini

In one of the earliest letters exchanged between magician Harry Houdini and Sherlock Holmes creator Sir Arthur Conan Doyle, a fervent Spiritualist, the English author asks his friend about the mysterious powers of one Professor Bert Reese.

In actual fact, Reese was no professor—his real name was Berthold Riess (1841–1928). A fat, bald, and jovial character, Reese toured the world astounding crowned heads and the cream of the crop of society with his demonstrations of apparent telepathy. Thomas Alva Edison, inventor of the phonograph, had seen him perform and became convinced that he really possessed supernatural powers. "Most prodigies are merely prodigies, meaning, really, nothing, and this may be the case with Reese," said Edison with nonchalance. "But, on the other hand, he may mean something—something big. I cannot, yet, explain his power. Apparently he saw through solids. But—Well, why not? Do not X-rays do that?"

Berthold Riess

The Pellet Test

Predictably, Houdini was less impressed. He wrote to Doyle:

> Reese, is, without doubt, the cleverest reader of Messages that ever lived. He has deceived the great minds of Germany—in the Courts—winning a lawsuit, and in America, I know he has made children of our brainiest men. Edison actually believes in him, and when charged with fortune-telling in Judge Rosalsky's Court, he gave a test for that shrewd man of the world, and convinced him that he was genuine; and was discharged. Reese knew who I was, when I called for a sitting, and I will say that, of all the clever sleight-of-hand men he is the brainiest I have ever come across. I was amazed at his skill, and if I had not been extremely familiar with all sleights, and all moves of Mediums, who resort to the Pellet Test, I would have been completely fooled. Why, he allows you to hold the Pellets in your hands, place them in your pocket and asks you which one he will read and answer first—you open them yourself—and, sure enough, it has been properly read! He failed to answer one peculiar question I put in writing: "What am I building, and for whom?" Rather a strange question, but it happened that I was having constructed an Exedra for my Beloved Mother, and naturally he could not "guess," though, from the other questions he answered, he is a gifted reader of character and judges human beings perfectly. I caught him red-handed, and he acknowledged it was the first time in his life that anyone had ever "recognized his Powers." And I'll put it in writing that he was the slickest I have ever seen.

What was Reese doing then? What is the "Pellet Test"? A pellet, in magician's lingo, is a billet rolled into a ball. Reese would ask his sitters to write something on their billets while he left the room: a question, a name or something else. When he would return, the billets would be rolled into balls—pellets—and he would correctly guess the content of each one.

According to Martin Gardner (1996)

> . . . the best account of Reese's methods is certainly "Bert Reese Secrets," by magician Ted Annemann, published in the 1936 Summer Extra issue of his periodical, *The Jinx*. It includes a photograph of Reese, his hand holding the cigar that he habitually smoked during his performances because it made it easier to palm a folded billet. [illegible]

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tinguished German-born philosopher and psychologist Hugo Munsterberg (1863–1916) became such a believer in Reese's powers that he was preparing a book on him when death prevented its finish.

Unlike his friend William James, Munsterberg was a well-known skeptic of the paranormal who had an expansive record of exposing mediums and other psychic charlatans with carefully contrived traps. One of his most celebrated exposures was that of Eusapia Palladino (Polidoro and Rinaldi 1998). Gardner was unable to verify this. I would like to take this opportunity to repeat Gardner's question about this episode: "Can any reader shed light on Annemann's startling claim?"

Houdini explained that all so-called "pellet readers" were swindlers, even if they did not claim to use psychic powers. The allusion to Bert Reese was clear.

Houdini Fixes Reese

As usual, Doyle could not be persuaded that someone could really deceive a luminary of some sort, and so Doyle wrote again to Houdini, asking if he was sure that this was the same Bert Reese "because I hear stories of his proof in court to a New York magistrate, and also to Edison, which don't seem to fit into fraud." Houdini swiftly replied:

> You have heard a lot of stories about Dr. Bert Reese, but I spoke to Judge Rosalsky and he personally informed me that, although he did not detect Reese, he certainly did not think it was telepathy. I am positive that Reese resorts to legerdemain, makes use of a wonderful memory and is a great character reader. He is incidentally a wonderful judge of human beings.
>
> That he fooled Edison does not surprise me. He would have surprised me if he did not fool Edison. Edison is certainly not a criterion, when it comes to judging a shrewd adept in the art of pellet-reading.
>
> The greatest thing Reese did, and which he openly acknowledged to me, was his test-case in Germany when he admitted they could not solve him.
>
> I have no hesitancy in telling you that I set a snare at the séance I had with Reese, and caught him cold-blooded. He was startled when it was over, as he knew that I had bowled him over. So much so that he claimed I was the only one that had ever detected him, and in our conversation after that we spoke about other workers of what we call the pellet test—Foster, Worthington, Baldwin *et al*. After my séance with him, I went home and wrote down all the details.

Oddly enough, Doyle did not contradict Houdini but accepted his words as fact: "Many thanks, my dear Houdini. If you say you *know* Reese to be a trickster, I shall take him as such." Of course, the two figures were just at the beginning of their strange relationship—their friendship had not yet gone to pieces.

In July of 1926, only three months before his own death, Houdini spoke on New York radio station WOR, denouncing all pretenders to supernatural powers. He further explained that all so-called "pellet readers" were swindlers, even if they did not claim to use psychic powers. The allusion to Bert Reese was clear. So much so that, after the program, Houdini received a phone call at his home from an agitated Reese.

Houdini, as usual, sent him a letter by registered mail the following day, with return receipt, "so that there can be no mistake of your attitude toward me." In it, he detailed their first meeting:

> In the séance you gave me, where you purported to read the five messages I had written, surmising that you must have some adroit method of opening the non-crinkling paper which you handed me, you will remember I purposely made peculiar shapes of the 'pellets' so that when you started to read my questions the astonished look on your face told me that you had been totally unprepared for this maneuver.

Houdini went on to detail Reese's accomplishments abroad and his performances in front of scientists and then proceeded to propose a test: "I will write five questions or sentences. . . . Should you be successful in reading the five questions, I will pay you an extra $500. . . ."

But Reese did not reply. Instead, he went personally to Houdini's home. He begged him not to expose his work, saying that he was an old man of eighty-three and made his living by giving people the illusion that he possessed some psychic powers. "If you don't claim to get messages from spirits," was Houdini's reply, "and if you admit that it is accomplished by natural means, I will close the argument."

"No," said Reese, "I don't claim to be a medium or a spiritualist, I don't get messages from disembodied spirits. Never claimed that."

"Well, you have fooled a lot of people."

"Oh, yes . . . I can't keep their mouths shut. I am only an entertainer. . . . People have so much faith in me that I can cure them."

"What do you mean cure them?"

"Oh, I can do things for them, especially if they are hypochondriacs! I talk to them. Oh, I cure thousands. . . ."

Then, returning to the subject of pellet reading, Houdini said: "You have the best method in the world—that is, that I have ever seen".

"Yes, and I am going to keep it for myself!"

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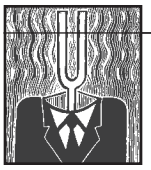

Betty Hill's Last Hurrah

A Secret UFO Symposium in New Hampshire

One of the most curious events to come out of the Great Internet Stock Bubble was the so-called Encounters at Indian Head project, the very existence of which has been kept unknown to the public until just now. The symposium was prepared under a shroud of secrecy that was amazingly effective, given the decades-long inability of most top UFOlogists to behave responsibly about anything. Organized by the late Karl Pflock (see his obituary in SI November/December 2006), author of *Roswell: Inconvenient Facts and the Will to Believe* (Prometheus, 2000) and the British Fortean author Peter Brookesmith, the event was funded by Joe Firmage, the Silicon Valley then-multimillionaire who seems determined do whatever it takes to bring the public into an even higher state of extraterrestrial awareness.

In September of 2000, I traveled from California to New Hampshire to participate in the secret "stealth" UFO symposium. The subject was the alleged 1961 UFO abduction of Betty and Barney Hill, the first such incident reported in the United States, made famous by John Fuller's 1966 book, *The Interrupted Journey*, then even more so by the 1975 NBC-TV movie, *The UFO Incident.* Firmage was covering all our expenses and even paid us for the rights to the papers we were writing, which would be published together as a book. The purpose of the symposium was, simply, to find out what *really happened* to Betty and Barney Hill. The plan was that nobody would find out about even the existence of the symposium until the book containing its published proceedings appeared "out of the blue," presumably creating a sensation. The symposium came off exactly as planned, a tribute to the skills of Karl Pflock.

The event was held at the Indian Head Resort, just a stone's throw from the spot where Betty and Barney Hill allegedly saw the UFO cross the road and hover in front of their car. The setting and accommodations were unarguably splendid; the company, surprisingly congenial. UFOlogists, even those who are in general agreement with each other, have a reputation for feuding like Hatfields and McCoys. The high level of the discussion was probably due to the organizers' careful decision to exclude those UFOlogists who have a reputation for insufferable behavior, whatever their knowledge of the subject. Bravo, Karl. The pre-symposium secrecy ensured that we would not be troubled by the press, the curious, or by certain UFOlogists known for being pushy and obnoxious. However, the insistence in the nondisclosure agreement for post-event secrecy was more difficult to understand. In January 2001, Pflock announced the "suspension" of the Indian Head project to its participants. The ongoing Internet stock collapse undoubtedly cut into Firmage's discretionary spending, with the once high-flying company he founded, U.S. Web, now bankrupt and liquidated. Still, Firmage paid every cent promised to the participants. With Karl Pflock's death, I presumed that the project would be defunct and that the nondisclosure requirement might last indefinitely. But Karl's widow, Mary Martinek, completed the editing, and the result is the volume, *Encounters at Indian Head*, published by Anomalist Books (see http://tinyurl.com/2ddmu2).

The *Grande Dame* of UFOlogy, the late Betty Hill herself, was present to guide us through a reenactment of the entire "abduction" scenario, assisted by her niece Kathy Marden, who knew the story almost as well as Betty did. I'd met Betty several times before. She regaled us with stories about her literally hundreds of UFO sightings that occurred after her initial UFO "abduction." She claimed that she organized an entire "Invisible College" of scientists from top laboratories who went out with her to observe and study these UFOs, gathered reams of documentation and data on them, then apparently destroyed it all, as it was their intention to merely *study* the UFOs and not publish anything about them.

Several of the more naïve participants spoke of how listening to Mrs. Hill had made it more difficult for them to accept the reality of her accounts, as if Mrs. Hill's wild stories had not been well-known in UFOlogy for at least

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Joe Firmage (standing) addresses attendees at the secret UFO symposium at Indian Head Resort. Seated, from left: Dennis Stacy, Betty Hill, Greg Sandow, Eddie Bullard, Hilary Evans, Peter Brookesmith, and Karl Pflock. (Photo by the author)

twenty-five years. It was the way she told of greeting the extraterrestrials with a jovial "Hi, guys!" that stuck in the throat of several of the participants. *Not a single* participant in the symposium was willing to describe the Betty Hill we heard firsthand as a credible witness; nonetheless, a number of them still were inclined to accept her story of alien abduction, including Pflock. The organizers had wisely chosen to send Betty Hill away before we began the actual discussions, as they realized it would be impossible for us to objectively discuss the mental state of a kindly but delusional old lady who was sitting in our midst.

Most of the symposium participants were well known in the UFO and Fortean worlds. Co-organizer Peter Brookesmith, of *Fortean Times* magazine, showed himself to be a no-nonsense fellow who also took the partying aspect of the conference very seriously. The good times quaffing with Peter, Karl, and Karl's wife, were memorable. Another Brit in attendance was Hilary Evans, whose writings sometimes seemed a bit woozy, but who, in person, seemed sensible enough. Two participants were present only virtually. Walter N. Webb, who began a firsthand investigation of the Hill case a month after it occurred in 1961, and Martin Kottmeyer, who writes amazingly perceptive papers without ever leaving his farm in central Illinois, participated from a distance via telephone and fax.

In addition to the conference sessions, we took a field trip. First, we took the short drive to where the UFO encounter allegedly occurred, just south of the hotel. According to Betty, the site is on the east side of Route 3 just north of the present Route 93 freeway interchange (exit 33). She showed us where Barney left the car in the middle of the road with the engine running while he grabbed binoculars from the trunk to get a good look at the aliens. Betty also guided us to the alleged "capture site," a small, sandy clearing in the woods just off Mill Brook Road, which goes off New Hampshire State Route 175 to the east near Thornton. However, Barney and Betty Hill much earlier had indicated a "capture site" in a different location. One driver, seeing the small crowd in the woods, stopped to ask if there was a moose about (tourists often travel these back roads seeking moose encounters). I replied no, and, although I didn't have the inclination to explain that we were chasing UFOs, someone else did, and the driver sped away.

You can learn a lot about a UFO case by visiting the site that you can't learn by reading about it. Driving from the "close encounter" site to the "capture" site, I was surprised to see how many quaint little New England towns lie between them. While driving frantically, allegedly being pursued by the UFO at close range, the Hills must have driven through the towns of North Woodstock, then Woodstock, West Thornton, and then Thornton. The speed limit in (and around) these towns is 30 mph. Even granting that these sleepy little towns, which look like they've come out of Norman Rockwell portraits of New England life, would be quiet around midnight, it seems impossible that nobody would have noticed a car madly speeding down Route 3, screeching around corners and running stop signs and traffic signals with a low-level UFO in close pursuit. This is related to another great puzzle, to wit: why is it that we never receive reports of UFOs coming in menacingly close but following *someone else's car?*

We even had an evening screening of relevant science-fiction films, including the very episode of *The Outer Limits* suggested by Kottmeyer to have inspired Barney Hill's description of the aliens' "wrap-around eyes." There was much discussion of the possible influence of the films on the Hills' account. Firmage sat by himself watching the films, saying nothing. He spent much of his time during the symposium sessions glued to the phone in the hotel lobby, no doubt negotiating major business deals back in Silicon Valley. His participation was slight. I did have a chance to speak with him for a few minutes during the first evening session. He confidently expounded one dissident physicist or another's theory showing that it is possible to do the things that UFOs allegedly do: travel faster than light, defy gravity, etc. For him, this settled the matter; such things were possible, and we should drop our present-day prejudices. He seemed not to appreciate the objection that the great majority of physicists were unconvinced by unsupported speculative theories, or else he seemed not to care. Firmage is an impressive, dynamic speaker, but apparently not such a good listener.

Ultimately, no agreement was reached concerning whether the Hills' story was real or imagined. Each participant (except for Greg Sandow) delineates his viewpoint at length in a chapter in the book. Eddie Bullard, Greg Sandow, Walter Webb, and Karl Pflock argued that the Hills' abduction account should probably be taken literally. I argued strongly for the opposite, as did Peter Brookesmith. Martin Kottmeyer and Hilary Evans agreed that the explanation was more likely to be psychological than physical. Dennis Stacy, a former editor of the *MUFON Journal* and the publisher of the symposium volume, limited himself to carefully chronicling and recounting the incident. However, in private conversation, he confessed to difficulties with accepting the Hills' account. Sociologist Marcello Truzzi pronounced it impossible to come to any conclusion whatsoever.

It was clear that the participants who had not previously met Betty Hill were dismayed and/or disappointed after hearing her glibly ramble on about things that could not possibly be true. There were rationalizations aplenty as to why we should believe her claims made in 1961 but not afterwards. I also felt that co-organizer Pflock and sponsor Firmage had expected some sort of pro-Hill consensus to emerge from the discussions when all of the "facts" supporting it were marshaled—and were rather disappointed when it did not. One of the pieces of evidence in favor of the alleged abduction has long been Betty's statement that her husband, Barney, after having his genitals examined by aliens, developed a ring of warts around his groin. The pro-abductionists seemed genuinely startled to be told (after Betty had safely departed) that this symptom is evidence not of alien activity but of a common sexually transmitted disease.

In the almost seven years that have separated the symposium and its public revelation, a great deal has happened. Three of the participants have passed away: Marcello Truzzi, Karl Pflock, and Betty Hill. Indeed, Indian Head itself has collapsed. The famous rock formation on the mountainside that seemed to suggest an Indian's face, behind which, the Hills' UFO was said to have passed, was for many years a noted New Hampshire tourist attraction. It collapsed suddenly in 2004, perhaps rendering divine commentary on the matter in question. However, "flying saucer physicist" Stanton Friedman has a new book just out, coauthored with Betty Hill's niece Kathy Marden: *Captured! The Betty and Barney Hill UFO Experience: The True Story of the World's First Documented Alien Abduction.* A story like the Hills' is simply too good for UFOlogists to ever let it die. ☒

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Typical of Houdini, he asked Reese to pose for a picture with him but Reese refused. Then, Houdini made Reese promise not to claim to be a medium or to have telepathic powers and let him out.

Soon after, further evidence of Reese's deceptions came to light. A few years earlier, he had been investigated in Germany by a lawyer, Bruno Birnbaum, and Albert Moll of the German Psychological Society. It appears that, while in Berlin, Reese had convinced a famous critic, Felix Hollaender, that some occult powers were working against him. However, since Reese found Hollaender to be such a nice person, he would help him.

"I will do something," said Reese, "that I have rarely done for anyone else. I shall defeat the machinations of the evil forces opposed to you. How many letters are in your Christian name?"

"Five," replied Hollaender.

"Good," remarked Reese. "Give me seventeen dollars for every letter in your name. I shall send this money to New York, where it will be used to combat the evil influences that conspire against you. I can say no more and explain no more. It is a matter of mutual trust. I warn you not to speak of this matter to any one else, not even your wife, or all my efforts will be frustrated." It was a typical swindle, still used today by many self-professed psychics, astrologers, and other charlatans of various kinds. By this means, Reese had been able to gather consistent sums of money from gullible people who, more often than not, were also learned men of science and culture.

Best Wishes to Mussolini

There is a curious postscript to Reese's life. He died an old and apparently rich man in 1928, and, well after his death, it was discovered that he also had good relations with Italian dictator Benito Mussolini.

In 2004, a blogger (Biowulf7 2004) reported that he had discovered among his grandfather's documents a letter, dated May 29, 1925, handwritten by Reese, to Baron Paolucci De Calboli, the Private Secretary of Mussolini. The use of the English language is quite funny. [All spelling mistakes and grammatical errors were Reese's—Eds.]:

> My Dear Baron
>
> The Bearer of this is a large Real Estate Man, and a very good friend of mine, Mr. Gross. He wishes to shake hand of Mr Mussoline, please dow anything you can for him while in Rome thanking you in advance for any Curtese you show him Iam with best regards to you and Mr Spavini please if Mr Spavini from Napilo is in Rome at present show him this letter and he also can ad to this Gentleman who is accompanied by his wife my best wishes to Mr Mussolini and yourself I am yours
>
> Very truly
> Prof Bert Reese

Quite a new chapter on the life of Reese (and Mussolini!) could be opened up, if new evidence of his admiration for the dictator shows up. Any reader who can shed light on this is quite welcome to write in.

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The (Non)Mysterious Orbs

Q: People keep showing me pictures that have "orbs" in them. They usually look like round spots of light. Some of these people claim that the orbs are angels or ghosts. Any idea what they really are?

—R. Wilber

Figure 1. A ghostly orb photographed in the haunted soldiers' barracks at Fort George, in Niagara-on-the-Lake, Ontario, Canada.

Figure 2. Further investigation reveals that the "orb" was simply a tiny dust particle, caught in a spiderweb, reflected by a camera flash.

A: Orbs appear over my desk on a regular basis. Well, actually, they come across my desk every month or two, when someone sends me, either by e-mail or postal mail, photographs of "mysterious" orbs they find scary, amazing, or simply puzzling. Orb photos are essentially like Rorschach cards, though the forms are usually white and round instead of black and blobby. The interpretations of both, however, reveal much about how the viewer sees the world.

According to most books on ghosts and hauntings that are written by authors with more enthusiasm than critical-thinking skills, just about anyone can find evidence of ghosts using a common device in nearly every home: a camera. Orbs have also been reported in connection with crop circles and UFOs; they are a good, all-around "unexplained" [redacted]

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many paranormal scenarios.

Most orbs are simply round or oval white shapes, though they may take a variety of forms. There is not one blanket cause for all orbs; many things can create the phenomena, ranging from insects to dust. In a series of experiments, I was able to create orb photos under a wide range of circumstances. The easiest way to create orbs is to take a flash photograph outdoors on a rainy night. The flash will reflect off of the individual droplets and appear as dozens of white, floating orbs. (The effect is most pronounced in a light rain, though even a little moisture in the air can create mysterious orbs.) CSI Senior Research Fellow Joe Nickell (1994), in his own studies, found that flashes reflecting back from camera straps are a common source of orbs, as are unnoticed shiny surfaces that can reflect a camera flash.

During one investigation I conducted at Fort George ("Canada's most haunted place," in Niagara-on-the-Lake, Ontario), I examined a large, wooden barracks where both ghosts and orbs had been reported. I took several flash photographs of the area, and I noticed that the building (essentially, a barn-like structure) was quite dusty, which can create orbs. As a television crew interviewed some ghost hunters, I noticed one orb, photographed it, and wondered what it might be (see figure 1). It was at about chest height and did not move at all, suggesting that it was neither an insect nor a dust particle; instead, it seemed supernaturally suspended in the air. It was several feet away from the nearest post, wall, or other visible means of support. It was quite odd, I had to admit. I showed the image to one of the ghost hunters, who seemed pleased that a skeptic had indeed captured what was obviously a ghost orb.

Not content to simply declare my orb a sign of the supernatural, I searched

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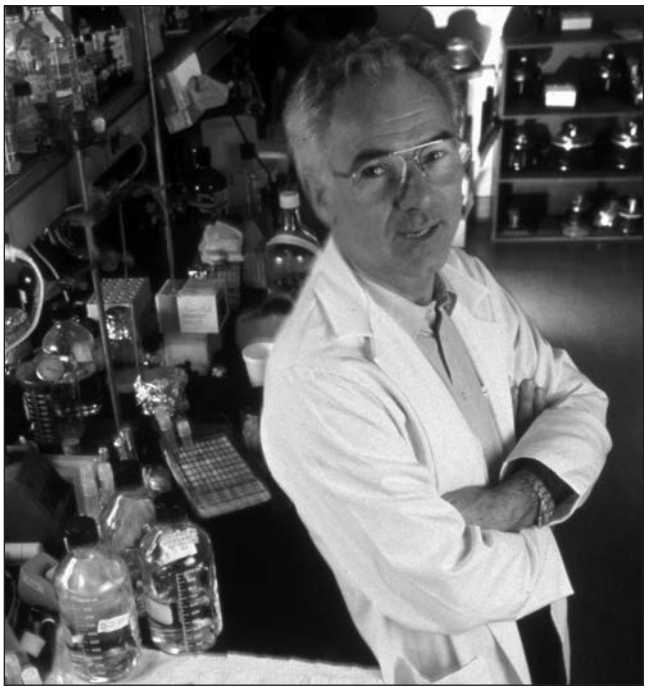
AIDS
Denialism vs. Science

AIDS denialists believe, with a faith unshakable by fact, that HIV does not cause AIDS and that antiretrovirals should not be used for HIV prevention or treatment. Their misrepresentations and pseudoscientific views have cost lives in South Africa and elsewhere.

NICOLI NATTRASS

Acquired immunodeficiency syndrome (AIDS) has killed more than twenty-five million people and remains a major threat to humankind (UNAIDS 2006). The human immunodeficiency virus (HIV) causes AIDS by undermining the immune system, eventually resulting in death (Simon et al. 2006). Although no cure has been discovered, scientific advances have resulted in the development of antiretroviral drugs (ARVs) to prevent mother-to-child transmission of HIV (Brocklehurst 2006) and to extend the lives of AIDS patients (Smit et al. 2006). HIV has been isolated and photographed, and its genome has been fully described. Yet a group of AIDS denialists in Australia (the so-called Perth Group) insists



Peter Duesberg, prominent (and notorious) AIDS denier (Photo by Robert Holmgren/ZUMA Press. © 2003 by Robert Holmgren [Photo via Newscom])

that HIV does not exist—recently testifying to this effect in an Australian court in defense of Andre Parenzee, an HIV-positive man charged with having unprotected sex with several women and infecting one of them with HIV. Other AIDS denialists accept the existence of HIV but, following Peter Duesberg (a molecular biologist at the University of California), believe it to be harmless. What unites them all is the unshakable belief that the existing canon of AIDS science is wrong and that AIDS deaths are caused by malnutrition, narcotics, and ARV drugs themselves.

AIDS denialists are eccentric but not irrelevant, because they campaign actively against the use of ARVs and promote the dangerous view that HIV is harmless (and some say not even sexually transmitted). South African president Thabo Mbeki took the AIDS denialists so seriously that he delayed the introduction of ARVs to prevent mother-to-child transmission of HIV and invited the leading AIDS denialists to serve on his "Presidential AIDS Advisory Panel" (Nattrass 2007). They recommended that ARVs be avoided and that all forms of immune deficiency be treated with vitamins and "alternative" and "complementary" therapies including "massage therapy, music therapy, yoga, spiritual care, homeopathy, Indian ayurvedic medicine, light therapy and many other methods" (PAAP 2001, 79, 86).

Author Nicoli Nattrass

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This leap—from the critique of mainstream biomedical science on AIDS to the promotion of unproven and unregulated alternative therapies—is a replay of the classic quack-marketing strategy of promoting belief in alternative remedies by sowing disbelief and skepticism about the medical establishment (Hurley 2006, 216). It is thus not surprising that AIDS denialism has been used by vitamin salesmen (notably the Dr. Rath Health Foundation), self-styled alternative healers, and some traditional healers to promote their worldviews and products (Nattrass 2007). One of South Africa's current health-policy failings is that, instead of cracking down on those making unsubstantiated health claims and creating markets for their wares, the health minister (Manto Tshabalala-Msimang) has provided cover and support for them.

AIDS denialists downplay their links with the purveyors of alternative therapies, preferring instead to characterize themselves as brave "dissidents" attempting to engage a hostile medical/industrial establishment in genuine scientific "debate." They complain that their attempts to raise questions and pose alternative hypotheses have been unjustly rejected or ignored at the cost of scientific progress itself.

Dissent and critique are, of course, central to science, but so, too, is respect for evidence and peer review. While it was intellectually respectable to dissent diametrically from mainstream views in the early days of AIDS science when relatively little was known about AIDS pathogenesis, this is no longer the case. In the 1980s, it was understandable that AIDS dissidents were uneasy about the claim that one virus could cause so many different diseases. But, once it was shown that HIV worked by undermining the immune system, thereby rendering the body vulnerable to a host of opportunistic infections, their concerns should have been put to rest. Similarly, the wealth of data on the successes of ARV treatment should have alleviated their initial worries about its overall therapeutic benefit. Thus one of the early AIDS dissident doctors, Joseph Sonnabend, had, by 2000, welcomed the life-saving capacity of ARVs, describing them as a "wonderful blessing" (Sonnabend 2000). However, this did not deter today's AIDS denialists, who continue to cite his dated views on their Web sites in support of their unchanged views.[1]

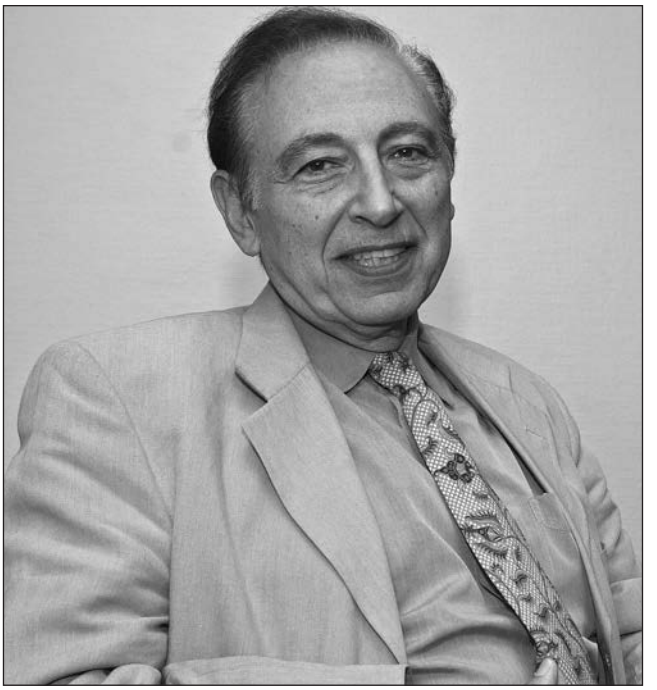
Given their resistance to all evidence to the contrary, today's AIDS dissidents are more aptly referred to as AIDS denialists. This stance may be attributable, in part, to a genuine misunderstanding of the science of HIV. For example, in his affidavit to the Australian court in the Parenzee case, a member of the Perth Group, Valendar Turner, testified that HIV had not been isolated because it had been identified only through the detection of reverse transcription (the process of writing RNA into DNA), an activity not unique to retroviruses (Turner 2006, 4). In subsequent testimony for the prosecution, Robert Gallo (the discoverer of retroviruses and codiscoverer of HIV) pointed out that HIV had been identified as a retrovirus through the detection of reverse transcriptase, which

is an enzyme unique to retroviruses, not the activity of reverse transcription, per se. He added that "only a fool" would mistake the two (Gallo 2007b, 1310, 1313–1314).

Misunderstanding the science of AIDS may be part of the story, but it does not explain why AIDS denialists are so hostile to and disbelieving of AIDS science. Part of the answer probably has to do with the belief that AIDS science cannot be trusted because the "scientific establishment" has been corrupted by the pharmaceutical industry (see, e.g., Farber 2006). This resonates with what Jon Cohen (2006, 1) calls "pharmanoia," or "the extreme distrust of drug research and development that's sweeping the world." John le Carré's novel (and subsequent hit Hollywood movie) *The Constant Gardener*, which provides a conspiratorial account of unethical medical trials in Africa, is a classic in this genre (Le Carré 2001). This book was cited approvingly in a South African AIDS-denialist document coauthored by President Mbeki as being "well researched" and "illuminating" about the way the pharmaceutical industry influences academic research (Mbeki and Mokaba 2002).

The pharmaceutical industry is, of course, far from angelic. There are documented cases where drug companies have designed trials in ways to promote sales of particular products rather than to test the best possible treatments; where clinical trials in poor countries have been unethical; where early research indicating dangerous side effects has been ignored for too long; where patent law has been abused to prevent low-cost competition; where too many resources have been spent on marketing "me-too" drugs (that is, drugs that are only marginally different from existing products) rather than investing in innovative drug development; and where unethical financial inducements have been made to doctors, researchers, and politicians (Goozner 2004; Angell 2005). However, what such cases suggest is that the pharmaceutical industry (and industry-funded research) needs to be carefully scrutinized and regulated. It does not imply that the entire industry and associated medical science are harmful to humans. As Cohen (2006) argues, the problem with the new pharmanoia is that it has put "Big Pharma" on a par with "Big Tobacco" and, through wild exaggeration, has turned "shades of moral grey into black."

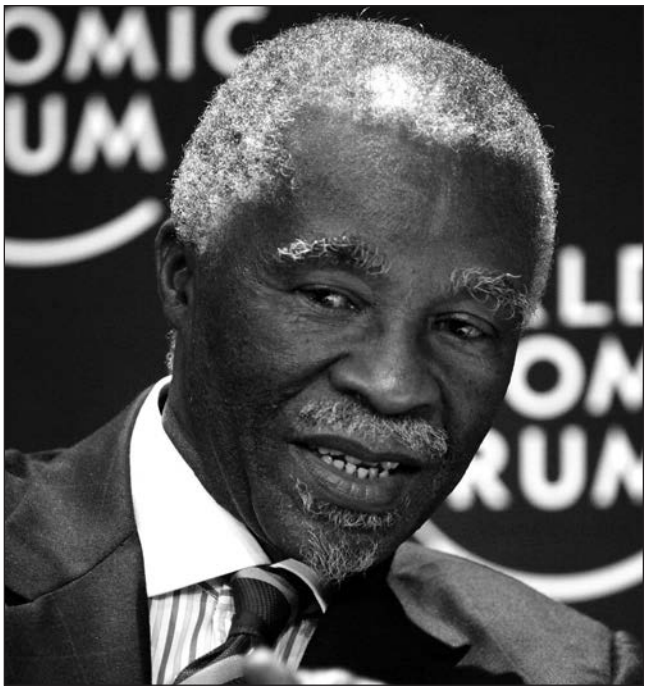
The same applies to AIDS research, where the pharmaceutical industry has a clear incentive to fund and support those research activities most likely to generate profits in the future. This means that additional mechanisms need to be created to ensure that more risky and less profitable—but nevertheless important—areas of research, like vaccine development, are supported. It does not imply, as asserted by the AIDS denialists, that the pharmaceutical industry is funding a global conspiracy including all AIDS scientists, epidemiologists, and medical practitioners to invent a disease in order to market harmful drugs. (This tactic has also been used to great affect by Kevin Trudeau in his infomercials; see SI January/February 2006, "What They Don't Want You to Know.") Aside from there being no evidence for this, the idea is incoherent, because the profit motive driving pharmaceutical companies gives them an incentive to keep people alive on chronic therapy as long as possible, not to kill them off quickly with dangerous drugs.



Robert Gallo, the discoverer of retroviruses, devoted ten pages of his book on discovering HIV to demolishing Deusberg's speculations. (AFP Photo/Roland Magunia [Photo via Newscom])

Disrespect for AIDS scientists and physicians is a defining characteristic of AIDS denialists. Protected by a cloak of hubris, they portray themselves as lone, persecuted standard-bearers of the truth.

Disrespect for AIDS scientists and physicians is a defining characteristic of AIDS denialists. Protected by a cloak of hubris—only they have the intelligence and moral courage to see the world for what it is—they portray themselves as lone, persecuted standard-bearers of the truth. As AIDS scientist John Moore (2006, 293) commented bitterly, their stance implies that "tens of thousands of health care professionals and research scientists are either too stupid to realize that HIV is not the cause of AIDS, or too venal to do anything about it for fear of losing income from the government or drug



South African President Thabo Mbeki has encouraged AIDS deniers and slowed treatments. (Reuters/Finbarr O'Reilly, South Africa [Photo via Newscom])

companies." Equally galling for scientists is the fact that most of the outspoken AIDS denialists are journalists or academics with no scientific training and that those who have medical qualifications have never actually worked on HIV.

In the normal course of scientific engagement, this would leave the denialists with little if any credibility. Gallo made this point very well in the Parenzee court case with regard to Turner: "Is he a virologist? Does he do experiments on AIDS?" he asked the defense attorney when presented with Turner's belief that HIV had not been isolated. "No," interjected the judge. "He's qualified in emergency medicine." "I see," replied Gallo. "I am not. Don't ever come to me if you are hurt" (Gallo 2007b, 1272–1273). In a subsequent e-mail message to the scientists and activists who run the anti-AIDS-denialist Web site www.aidstruth.org, Gallo talked of his amazement at the "mass ignorance coupled with the grandiosity of selling themselves as experts" displayed by the Perth Group, saying that "it would be like us arguing with Niels Bohr on quantum mechanics" (Gallo 2007a).

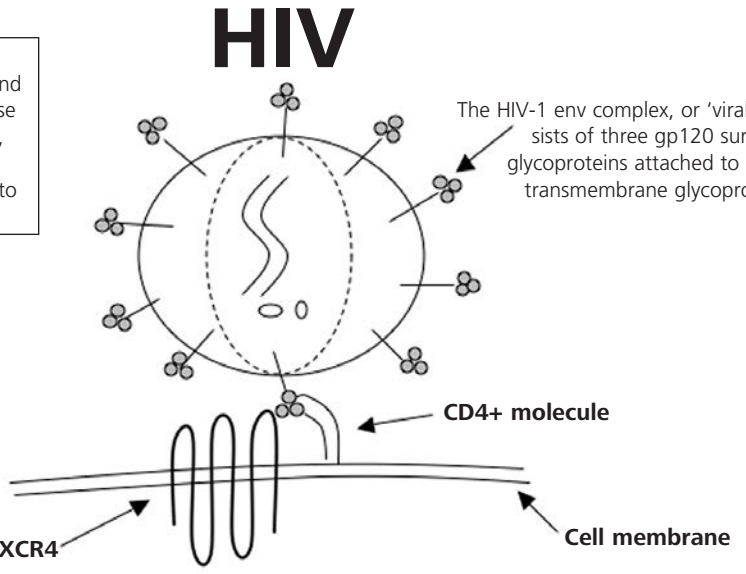
The only active AIDS denialist with any major scientific standing is Duesberg, who is a member of the National Academy of Sciences and the first person to isolate a cancer gene.[2] But his credibility to speak on AIDS is tarnished by the fact that he has never conducted any scientific research on HIV, let alone published it in peer-reviewed scientific journals. He simply does not have any evidence to support his erroneous claim that AIDS is caused by recreational and ARV drugs rather than HIV.

Unable to convince his scientific peers, Duesberg relies on the media (including the Internet) to promote his views

The Attachment of HIV to the Host Cell

HIV mostly infects the lymphocyte helper T-cell (also called a CD4 cell because of the CD4+ molecule on its surface as a receptor for attachment of HIV). HIV has a high affinity for CD4+ molecules. CCR5 and CXCR4 are chemokine coreceptors.

Inside each viron is a viral genome comprising two copies of HIV RNA and the viral proteins reverse transcriptase and integrase. Once inside the cell, these viral proteins are released to assist the integration of viral RNA into the host cell's DNA.


HIV
The HIV-1 env complex, or 'viral spike,' consists of three gp120 surface glycoproteins attached to a gp41 transmembrane glycoprotein.
CD4+ molecule
Coreceptors CCR5, CXCR4
Cell membrane

HIV infection results in significant loss of CD4 T-cells. This undermines the immune system, leading eventually to death. Normal count is 500–1,500 CD4 T-cells per microliter of blood. People with AIDS have below 200–350 CD4 T-cells per microliter

directly to the public. His cause was assisted substantially by *The Sunday Times* in London from 1992 to 1994, when the science editor ran many long pieces attempting to discredit AIDS science. This enabled Duesberg to achieve a form of socially constructed credibility outside of conventional scientific channels (Epstein 1996, 105–178), which, in turn, prompted John Maddox (then editor of *Nature*) to go on the offensive and subject *The Sunday Times* during this period to regular critical review in *Nature*.

Largely as a consequence of Duesberg's profile, the scientific community was compelled to pay greater attention to his ideas than was warranted by their content. In 1991, Gallo (1991, 287–297) devoted ten pages of his book on discovering HIV to demolishing Duesberg's speculations. A couple of years later, *Science* investigated Duesberg's claims and concluded that none of them stood up to scrutiny (Cohen 1994). Undaunted, Duesberg and his colleague David Rasnick restated their long-refuted hypotheses in a 1998 article (which was followed immediately in the same journal by a point-by-point refutation [Galea and Chermann 1998]). None of this had any impact either on Duesberg or on journalists such as Farber, who continued to promote his views, largely unchanged from the early 1990s.

AIDS scientists are understandably baffled by such conviction-driven refusal to accept the implications of the weight of evidence to the contrary. As Gallo said of Duesburg in 1988, he is "like a little dog that won't let go" (quoted in Cohen 1994, 1644). Moore (1996) went even further, comparing Duesberg to the Black Knight from *Monty Python and the Holy Grail* who, after having all his limbs hacked off by his opponent, keeps on trying to fight with his teeth.

One of Duesberg's tactics is to exploit the uncertainty that is ever-present in science and demand increasingly exacting standards of "proof," and, when this is not forthcoming, proclaim fallaciously that the alternative hypothesis must be true. As Maddox observed

> Duesberg has not been asking questions or raising questions he believes should be answered, but has been making demands and implying (but sometimes saying outright) to colleagues, "Unless you can answer this, and right now, your belief that HIV causes AIDS is wrong." It is as if a person were to have told Schrödinger in 1926, "Unless you can calculate the spectrum of lithium hydride, quantum mechanics is a pack of lies" (interestingly, that deceptively simple question is only now being answered). (Maddox 1993, 109)

This kind of fallacious reasoning is evident among other kinds of denialists, too, such as evolution deniers who see any gap in the fossil record as proof that God must have created the world (Mooney 2005).

Their zealous attachment to key ideas has a further consequence: the inability or refusal of AIDS denialists to weigh up risks and benefits. Thus, as soon as any toxicity can be shown for an ARV drug in any context, they conclude that the drug should not be prescribed in any situation. For example, when clinical evidence emerged that adverse events occurred among mothers on long-term Nevirapine therapy, this was seized upon by Farber (2006) to argue that Nevirapine should never be used in any circumstances—even as a single dose to prevent maternal transmission of HIV, a drug regimen that had been shown to be safe. When this error was pointed out (Gallo et al. 2006), the AIDS-denialist group "Rethinking AIDS" backed Farber's strategy on the spurious grounds that it moved "neatly" between the two trial results as part of a single argument against Nevirapine (Rethinking AIDS 2007). They claimed, without any evidence, that both trials showed significant adverse events, when, in fact, not a single life-threatening event has ever been shown for single-dose Nevirapine.

All "debates" with AIDS denialists end up in a stalemate simply as a consequence of their refusal to play by the rules of reasonable debate. This is evident in the "rapid-responses" Web pages of the *British Medical Journal* (BMJ), where AIDS denialists such as Papadopulos-Eleopulos and Rasnick accounted for a disproportionate amount of space before the BMJ revised its rules and excluded this "shouting match of the deaf" (Butler 2003). Typically, the denialists would paste large amounts of convoluted text into their rapid-response submissions and then argue at length with anyone who responded. After trying to engage with the denialists, Peter J. Flegg, a physician from Blackpool Victoria Hospital, finally erupted with the following:

> What is taking place on this forum is a farce, not a debate . . . . Good scientists are meant to accept new evidence and incorporate this into their hypotheses. The denialist approach is to ignore new evidence that is contradictory to their predetermined stance. After comprehensive rebuttal of any point of view, the denialist tactic is to quickly switch to a different topic. Then later, when no-one is looking, they can switch back to the original theme, hoping no-one will realise that these points were completely discredited on an earlier occasion. (Flegg 2003)

Exactly the same tactics are evident on science blogs when

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AIDS denialists enter into "debate." Tara C. Smith's science blog "Aetiology" hosted several rambling and ultimately unproductive interactions with AIDS denialists—most notably Harvey Bialy (Duesberg's biographer and fellow member of Mbeki's AIDS panel). The denialists conceded nothing, not even when the case was clearly an open-and-shut one to any reader. For example, AIDS denialists persistently cite an old study by Nancy Padian that reported low HIV transmission rates between sexual partners (Padian et al. 1997) as supporting evidence for their claim that HIV cannot be transmitted sexually. When reminded that participants in the Padian study were strongly counseled to practice safe sex (which means that the study cannot be used to back the claim that HIV, per se, is difficult to transmit sexually) and when presented with evidence from other studies showing that the risk of sexual transmission can be 20 percent or higher in developing countries, the denialists simply changed the topic. This prompted Chris Noble to comment:

> Well, we seem to have drifted a long way from the *famous Padian study* which according to Harvey Bialy "*demonstrated so well that sexually transmitted HIV was a figment.*"
>
> I note that Bialy never once made a comment that was relevant to the study. These are the people that claim that HIV cannot possibly cause AIDS. You ask them for justification and they give you the "Padian study."
>
> You demonstrate that this study cannot be used to conclude that HIV is not sexually transmitted and they go all silent, bring up other studies or in Bialy's case proceed to insult everyone that doesn't worship Peter Duesberg.
>
> I predict that in the future the exact same people will again cite the "Padian study" as proof that HIV is not sexually transmitted. (Noble 2006)

Exactly as he predicted, the denialists continued to misrepresent Padian's study (see Farber quoted in Kruglinski 2006 and Turner 2006, 13–14) and, even when Padian herself protested about the way that AIDS denialists have misused her work and ignored the available evidence (Padian n.d.). The denialists dismissed her piece as "info-ganda" (George 2006).

This lack of respect for the integrity of scientists makes it very difficult for AIDS scientists to make any headway. As Brian Foley, a scientist who works with the HIV database at Los Alamos National Laboratory, commented after a long blog exchange with South African AIDS denialist Anita Allen:

> There is no such thing as "scientific debate" really. Science is about experiments, data and theories to explain the data. If Anita says "The virus has never been isolated" and I say "In fact dozens of infectious molecular clones of HIV-1 have been generated and that is as good as "isolation" gets for retroviruses," one of us has to be lying. (Foley 2006)

Foley's comments point to the central role of integrity and respect for expertise in science. He is saying that for Allen, who is not a scientist, to claim that HIV does not exist amounts to her accusing him of misunderstanding or lying about the vast HIV databank he has at his fingertips. For him, her refusal to accept the mountain of evidence (and his bona fides to report it) amounts to her opting to believe—and propagate—lies.

As far as the scientific community is concerned, the "debate" over whether HIV causes AIDS has long been settled. As the AIDS scientists and activists who run the Web site www.aidstruth.org put it:

> For many years now, AIDS denialists have been unsuccessful in persuading credible peer-reviewed journals to accept their views on HIV/AIDS, because of their scientific implausibility and factual inaccuracies. That failure does not entitle those who disagree with the scientific consensus on a life-and-death public health issue to then attempt to confuse the general public by creating the impression that scientific controversy exists when it does not. (AIDSTruth 2007)

Unfortunately, President Mbeki was precisely one of those who was convinced that a scientific controversy existed—and, by slowing the rollout of ARVs in the public sector for both HIV prevention and AIDS treatment, his belief resulted in the loss of many thousands of lives (Nattrass 2007). He has also been associated with Christine Maggiore, the controversial HIV-positive American AIDS denialist who does not practice safe sex and campaigns actively against the use of ARVs (Moore and Nattrass 2006). When Maggiore was pregnant with her second child, she was featured on the cover of *Mothering* magazine with "no AZT" emblazoned across her abdomen. She did not take ARVs to prevent infecting her baby with HIV and increased the risk of transmission yet further by breastfeeding the child. Tragically, her daughter died three years later of what the Los Angeles coroner attributed to AIDS-related pneumonia

President Mbeki was precisely one of those who was convinced that a scientific controversy existed—and, by slowing the rollout of ARVs in the public sector for both HIV prevention and AIDS treatment, his belief resulted in the loss of many thousands of lives.

(Ornstein and Costello 2005). Maggiore, however, continues to deny that HIV had anything to do with the death, claiming instead that the child died because of an allergic reaction to an antibiotic, despite substantial evidence to the contrary (Bennett 2006).

People in positions of authority, be they statesmen like Mbeki or parents like Maggiore, hold the lives of others in their hands. For them to reject science in favor of AIDS denialism is not only profoundly irresponsible but also tragic. But responsibility for unnecessary suffering and death rests also with the AIDS denialists who promote discredited and dangerous views and encourage people to reject scientifically tested treatments.

Notes

1. See, e.g., www.virusmyth.net/aids/index/jsonnabend.htm.

2. Another AIDS denialist with scientific credentials is Kary Mullis, who won a Nobel Prize in chemistry for inventing the polymerase chain reaction. However, he, too, has never done any scientific research on HIV or AIDS and, unlike Duesberg, is not active in the AIDS denialist movement. His autobiography (Mullis 1998) documents his skepticism about the relationship between HIV and AIDS as well as his encounters with aliens and his belief in flying saucers and astrology.

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For more information on the scientific inaccuracies and other problems relating to AIDS, visit www.aidstruth.org.

What follows is an adaptation from Chris Mooney's new book, Storm World: Hurricanes, Politics, and the Battle over Global Warming. *Mooney is* Seed *magazine's Washington correspondent, a* SKEPTICAL INQUIRER *contributing editor, and a Committee for Skeptical Inquiry consultant. Having watched as his mother lost her New Orleans home in Hurricane Katrina, he set out to examine the high stakes scientific debate over how hurricanes may be changing because of our changing climate. What resulted, Mooney notes, was "a narrative of scientific understanding developing in real time, in all of its inevitable messiness, under immense political pressure and in the full glare of media scrutiny. Scientists, like hurricanes, do extraordinary things at high wind speeds. Such conflicts may bring out their human side, but also inspire their very best work."*

Now, in this excerpt from the book's conclusion, Mooney reflects on what he has learned—about the science but also about hurricane policy and high-profile scientific debates, in general.

Storm World
Hurricanes, Warming, and Scientific Uncertainty

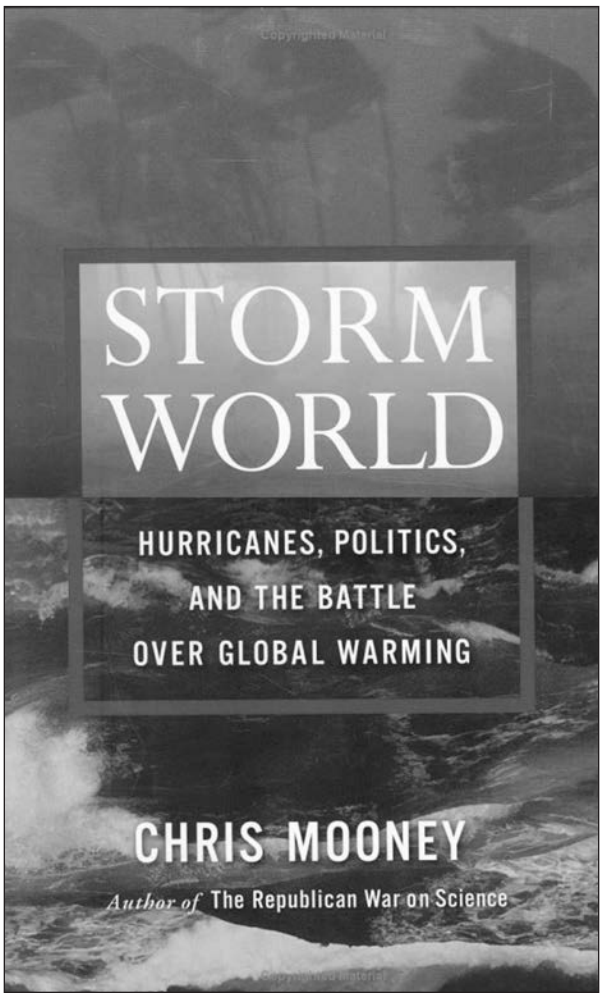
Regardless of how the scientific controversy is resolved over global warming's possible effects on hurricanes, our coastlines are increasingly vulnerable. And the hurricane-climate battle has lessons for scientists working in all controversial areas.

CHRIS MOONEY

There's no doubt about it: Global warming—which is already happening—*will* change hurricanes. If we know anything about these storms, it's that they respond sensitively to conditions in the atmosphere and oceans. Human beings are already changing the environments in which hurricanes form and attain their terrifying strength, which means hurricanes will inevitably change, too. Precisely how and to what extent remains very much unsettled, however, and that makes all the difference.

Despite everything they've learned about hurricanes during the decades since World War II, scientists still do not completely understand all the environmental factors that

cause them to develop and deepen. And global warming, which ought to intensify the average hurricane, could also change the regions of storm formation or the numbers of storms that form in the first place. Despite troubling signs, the evidence simply isn't in on all of these changes—not yet. And whatever does ultimately happen, it is unlikely to be simple or straightforward. "Welcome to the wonderful world of projections," says Greg Holland, a hurricane specialist at the National Center for Atmospheric Research in Boulder, Colorado, who has grown increasingly convinced of global warming's discernible impact on hurricanes.


STORM WORLD
HURRICANES, POLITICS, AND THE BATTLE OVER GLOBAL WARMING
CHRIS MOONEY
Author of The Republican War on Science

To further complicate matters, the extent of global warming itself depends on our own choices about energy use, population size, and much else in the coming century—including the policies we adopt (or fail to adopt) to restrain greenhouse gas emissions. With all of these variables, the precise global average temperatures that we'll see by 2100, or 2200, can't possibly be predicted. That makes their ultimate impact on hurricanes all the more uncertain.

To grasp just how complex it all really is, consider the well-established effect of El Niño upon hurricanes, which is brought about, among other factors, by the modulation of so-called vertical wind shear over the Atlantic (when winds at different altitudes blow in different directions or at different speeds, they can disrupt the organized structure of a hurricane). Thanks to the pivotal discoveries of scientists beginning with the famed Colorado State University hurricane scientist (and global warming skeptic) William Gray, we now know that El Niño tends to suppress hurricanes in the Atlantic but increase their activity in the Pacific. But how will global warming alter the frequency and strength of what scientists refer to as the El Niño–Southern Oscillation, or ENSO? At this point the question isn't remotely settled, though it makes sense that some type of change ought to occur. If it does, that throws another huge curveball into the hurricane-global warming discussion, particularly as it affects the United States.

Clearly, then, we can't give an exact answer about how global warming will modify hurricanes. Yet just because we can't perfectly quantify changing levels of risk doesn't mean we have no right to feel concerned.

It's an increasingly well-established result of climate science that the heating up of the world's oceans, including the warm pools of the tropics where hurricanes spin up after being triggered by various types of disturbances, has a large human component to it. Meanwhile, scientists going back to the pioneering tropical meteorologist Herbert Riehl have taught us that hurricanes are natural "heat engines" reliant upon ocean warmth for their power, even as modern theoretical and modeling accounts—including the work of MIT hurricane theorist Kerry Emanuel, the National Center for Atmospheric Research's Greg Holland, climate modeler Thomas Knutson of Princeton's Geophysical Fluid Dynamics Laboratory, and others—agree that global warming ought to intensify the average hurricane (though these theoreticians and modelers are still trying to work out precisely how much). Finally, although skeptics remain, at least for the Atlantic there are grounds for suspecting that global warming is contributing to a sharp rise in the total number of storms that form each year, as well as—inevitably—the number of very powerful hurricanes. Not only has a trend emerged; some leading scientists think we're its cause.

In late 2006, many of the experts involved in the hurricane-climate debate came together under the auspices of the World Meteorological Organization to reach a new consensus—albeit a temporary one—on hurricanes and global warming. They included Kerry Emanuel, Thomas Knutson, Greg Holland, Chris Landsea of the National Hurricane Center, Hugh Willoughby of Florida International University, Johnny Chan of the City University of Hong Kong, and numerous others who traveled to Costa Rica to pore over the science and figure out what they could reliably say about it. The scientists assembled agreed that there was still plenty of uncertainty all around—the debate had not been resolved—and the summary statement subsequently issued by the World Meteorological Organization in response to their endeavors was quite cautious. "No firm conclusion" could be made yet about whether hurricanes had changed in a detectable way due to human-induced global warming, it read. But the summary added that "it is likely that some increase in tropical cyclone peak wind-speed and rainfall will occur if the climate continues to warm." It also noted: "If the projected rise in sea level due to global warming occurs, then the vulnerability to tropical cyclone storm surge flooding

would increase."

When the Fourth Assessment Report of the United Nations' Intergovernmental Panel on Climate Change emerged in early 2007, meanwhile, it took a somewhat stronger stand on the hurricane-climate relationship. The report's "Summary for Policymakers" judged it "more likely than not"—in other words, the confidence in the conclusion was just above 50 percent—that there had already been an increase in intense hurricane activity, partly caused by global warming. A footnote, however, cautioned that this conclusion was based on "expert judgment rather than formal attribution studies." Other parts of the IPCC document mentioned the ongoing data difficulties, the detection of a trend in the Atlantic (correlated with rising sea-surface temperatures), and the expectation of future storm intensification based upon modeling studies like Thomas Knutson's.

Over the past decade or more, we have repeatedly seen powerful hurricanes course toward vulnerable coastal cities. Mercifully, most of them missed, but they won't always in the future.

While these statements clearly depict a field of science that's in flux, they also more than justify worry on the part of a journalist, a citizen, or a decision-maker. We don't know yet the precise "hurricane sensitivity" to climate change, but it could be very significant. By the time we successfully quantify it, we may already be well within its range. Perhaps we're seeing hints of that sensitivity kick in already in the form of spates of record-breaking storms. Perhaps we're seeing it in the Atlantic. And even if we haven't yet, we're likely to in the coming years.

* * *

But how should such knowledge, such worry, translate into action? The answer is tricky for one key reason: We're so disturbingly vulnerable to hurricanes in the United States (and for that matter, globally) that with or without global warming, we're virtually certain to see more disasters in the future. It's a staggering statistic: Half of the U.S. population lives within fifty miles of the coast. And they're not anywhere close to being ready to withstand a major hurricane's impact. "They don't even have building codes in some of the unincorporated areas of Texas and Louisiana," the National Hurricane Center's Chris Landsea points out. "So, much less getting ready for any potential scary changes [due to] global warming, we're not prepared for hurricanes as they are today."

Over the past decade or more, we have repeatedly seen powerful hurricanes course toward vulnerable coastal cities. Mercifully, most of them missed, but they won't always in the future. Many parts of the United States face a dramatic hurricane risk, with New York/Long Island, Miami/Fort Lauderdale, and Galveston/Houston probably topping the list if we judge by the potential for large-scale destruction and economic impacts to major population centers (and if we conveniently but arbitrarily ignore the possibility of another major storm hitting New Orleans). As for large loss of life: We're better off than some poorer parts of the world, but still extremely vulnerable in this regard as well, as Hurricane Katrina amply demonstrated.

And New Orleans is just one high-risk area. Among the U.S. regions vulnerable to the type of hurricane devastation that could trigger not only expensive damage but mass fatalities, the Florida Keys hold a special place. They can be overrun by storm surges and can't be evacuated without a lot of lead time, since a narrow two-lane highway must be relied upon to transport evacuees back to mainland Florida. That means the carnage from a powerful hurricane that makes a sudden turn—or one that rapidly intensifies—could be very great. The waters of Florida's Lake Okeechobee, meanwhile, have killed once before in a hurricane, in 1928, and scientists at Florida International University's International Hurricane Research Center suggest that the 140-mile earthen dike that protects 40,000 people from the lake could be breached again during a storm. Tampa/St. Petersburg and Cape Hatteras and Wilmington, North Carolina, also appear on the center's top-ten list of places most susceptible to a hurricane strike.

In light of this stark vulnerability—combined with a steady movement of persons and property into harm's way—Chris Landsea, disaster policy expert Roger Pielke, Jr., of the University of Colorado-Boulder, and many others have strongly argued that we must focus our primary attention on addressing the demographic and societal aspect of our hurricane quandary. It represented a landmark in the hurricane–climate debate when, in July 2006, most of the scientists involved put aside their differences and agreed that even as the scientific argument continues, "it should in no event detract from the main hurricane problem facing the United States: the ever-growing concentration of population and wealth in vulnerable coastal regions." As they explained:

> These demographic trends are setting us up for rapidly increasing human and economic losses from hurricane disasters, especially in this era of heightened activity. Scores of scientists and engineers had warned of the threat to New Orleans long before climate change was seriously considered, and a Katrina-like storm or worse was (and is) inevitable even in a stable climate.

The scientists refreshingly continued by extending their

knowledge to make some general political observations and recommendations, something too many scientists are afraid of doing even when those recommendations are fairly basic and obvious:

> Rapidly escalating hurricane damage in recent decades owes much to government policies that serve to subsidize risk. State regulation of insurance is captive to political pressures that hold down premiums in risky coastal areas at the expense of higher premiums in less risky places. Federal flood insurance programs likewise undercharge property owners in vulnerable areas. Federal disaster policies, while providing obvious humanitarian benefits, also serve to promote risky behavior in the long run.
>
> We are optimistic that continued research will eventually resolve much of the current controversy over the effect of climate change on hurricanes. But the more urgent problem of our lemming-like march to the sea requires immediate and sustained attention. We call upon leaders of government and industry to undertake a comprehensive evaluation of building practices, and insurance, land use, and disaster relief policies that currently serve to promote an ever-increasing vulnerability to hurricanes.

The statement signers included Kerry Emanuel, Greg Holland, Chris Landsea, Thomas Knutson, Peter Webster, Judith Curry of the Georgia Institute of Technology, former National Hurricane Center director Max Mayfield, Richard Anthes of the University Corporation for Atmospheric Research, and James Elsner of Florida State University. These scientists all deserve our applause for trying to translate their knowledge into meaningful action, and for managing to converge on this critical matter despite the ongoing uncertainty in the hurricane-climate debate. For especially when it comes to the Atlantic, the fact is that whether you think the recent uptick in hurricane activity is the result of global warming or a natural cycle—or some combination of both—we have every reason to expect more bad years ahead. To a large extent, we can let the scientists haggle it out while we just start protecting ourselves.

* * *

Yet even as we focus on the demographic and societal aspects of hurricane vulnerability, we can't ignore the possibility that long-term changes in hurricanes (or short-term changes if they're big enough) might also amplify our collective exposure. For someone with a coastal home in Florida, notes the University of Colorado's Roger Pielke, Jr., global warming really doesn't make a lot of difference in terms of how you deal with hurricanes: "You just have to adapt." But for those who are concerned not about one house but about overall trends in damage, and who are capable of studying and responding to future risks in an aggregate sense—large reinsurance companies, for example, or states and nations—the possible impacts of global warming can and should factor into the calculus. That's the world we now live in. Indeed, the very fact that our society has put so many lives and so much property in harm's way means that our leaders should worry *even more,* not less, that global warming could be making it all even more vulnerable.

Suppose, merely for the sake of argument, that we decide it's worth the money and resolve to undertake a massive engineering project to make New Orleans entirely safe from another hurricane storm surge for the next hundred, five hundred, or one thousand years. Any defense plans would then have to take into account not only projected sea-level rise due to global warming (perhaps well over a foot by the year 2100) but also the possibility of hurricane intensity and frequency changes. Because of scientific as well as societal and political uncertainties, no fixed number could be ascribed to either risk. Rather, the risk assessment would have to consider a range of possibilities (nothing new to risk assessors).

Hurricane Katrina, it seems safe to say, would not be the worst-case scenario in such an exercise.

None of this should be taken to mean that hurricanes *alone* justify imposing mandatory caps on emissions of industrial greenhouse gases, whether through the Kyoto Protocol or some other climate-change mitigation policy. Such policies are inherently slow-acting and long-term in nature. For the short term, though, we're committed to significant global warming that's already "in the pipeline." If that warming is going to change hurricanes further, it's a done deal and there's nothing the Kyoto Protocol or any other emissions policy can do to change that. So whatever we do about global warming, we should be preparing ourselves for hurricanes (including possibly stronger ones) no matter what.

It's a bit simplistic to offer up hurricanes as a reason for dealing with global warming anyway. By definition, if you change the climate you're changing almost *everything*—agriculture, sea level, the extent of ice and glaciers, the character of precipitation, the distribution of species and the likelihood of their extinction—the list goes on and on. If we're going to act to prevent such changes, then, we should do so because on balance we oppose *most or all* of them, not because of any one of them in isolation; and because we think it's worth preventing such wholesale alterations to the planet.

Still, there's no denying that amid all these hypothesized (and increasingly actualized) changes, the possibility of human-induced alterations to hurricanes has a unique way of grabbing the public's attention. The potency of this symbol has been, and will surely continue to be, misused by some environmental advocates who pay too little heed to the complexity of the science in their rush to make the powerful image of a cyclonic storm do political work on their behalf. We must oppose this exploitation and demand that advocates remain honest on both sides of the aisle. Still, it's easy to understand why hurricanes have become emblematic of many citizens' discomfort over our changing planet. Altering the Earth is scary; so are hurricanes; and provided we state the science properly, it's entirely defensible, on the basis of current knowledge, to conjoin these two types of concern. Hurricanes *will* change as a result of global warming. We don't know precisely how, but (as with so much else about global warming) it seems doubtful that it will be in a way that we like.

So we must address both hurricane vulnerability *and* global warming; we must do so simultaneously and yet in significantly different ways; and we must act not so much because of the linkage between the two, but rather because each poses intolerable risks to us individually. If we act promptly on both fronts, perhaps such action will have the added benefit

of helping to preserve a world in which, even as we're better protected against hurricanes, the worst-case hypothetical scenario—souped-up storms surfing atop dramatically higher seas to many locations they couldn't reach when the world was cooler—never has a chance of becoming a reality.

* * *

The hurricane-climate debate contains lessons stretching beyond hurricane or climate policy, however. It's emblematic of a situation that occurs repeatedly at the intersection of science and policy: Scientists appear to *disagree* about something very important—the science of global warming, the biomedical potential of different types of stem cells, the risk posed by bird flu, and dozens of other things. How should citizens, journalists, policymakers, and politicians respond when faced with these increasingly frequent scenarios?

The hurricane-climate debate contains lessons stretching beyond hurricane or climate policy, however. It's emblematic of a situation that occurs repeatedly at the intersection of science and policy.

The answer is that while the scientific disagreement may or may not be entirely honest—and the hurricane-climate debate is more honest than some—it need not be paralyzing. We should stop thinking we'll ever achieve scientific certainty (we won't), and instead realize that when making decisions at a societal or personal level, our duty is to take current knowledge into account. If a decision then results whose scientific basis later gets called into question, we should be open to revisiting that decision at that time. But we needn't apologize for the fundamental fact of science and reality that everything is, to a greater or lesser degree, uncertain and debatable.

The hurricane-climate debate demonstrates this perfectly: while we don't know *precisely* how global warming will change hurricanes, that's not really the point. What matters is that today, we know enough to be worried. Granted, it so happens that the most immediate policy implication for the United States—*get ready; take evasive action*—is probably the same whether or not global warming is significantly changing storms. But as we've seen, if we look to the longer term, or take a broader international view—recognizing that for poorer countries with exposed populations, expensive adaptation or coastal retreat isn't necessarily possible—then precautionary measures are certainly needed.

One key reason for this lies in the history of meteorology itself. Again and again, knowledge advances most reliably when theory, observations, and modeling all get taken into account and all converge upon a consistent answer. And in this case, all give grounds for worry.

The great virtue of theoreticians lies in their ability to distill a complex reality down to its fundamental components—to *explain* what's happening. Yet this very talent inevitably means that theoreticians (and modelers) will sometimes oversimplify. Witness the famed MIT meteorologist Jule Gregory Charney and his now rejected hurricane theory (which was dubbed "Conditional Instability of the Second Kind"), or nineteenth-century meteorological theoretician James Espy, who refused to accept that many storms have rotating winds. That's why theoreticians need "data" guys to keep them honest, to point out observations that complicate or contradict their theories—precisely what has happened in the hurricane-global warming debate.

Yet data alone, without a physical *understanding* of what's happening, can also blind and mislead. Correlations don't prove causation. Levels of rainfall in the African Sahel region can change in lockstep with Atlantic hurricane activity without causing changes in that activity. Global temperatures can go up and down and up again without these wiggles reflecting a natural cycle.

That's why any healthy science will inevitably balance both theoretical and empirical approaches. And when you take both approaches into account in the hurricane-climate debate, you once again wind up with reasons to worry. For example, in the opinion of one scientific observer—Hugh Willoughby of Florida International University—modeling studies (like those of Thomas Knutson of the Geophysical Fluid Dynamics Laboratory) present a "conservative estimate" of how hurricanes will change due to global warming, while two now famous data-based studies from the year 2005 may, in some aspects, show too dramatic an increase. "And of course," Willoughby continues, "the truth lies somewhere in the middle."

So while it would be uncharitable not to respect and admire longtime hurricane expert William Gray for all he's achieved over the course of his scientific career, it remains hard to swallow his outright rejection of climate modeling. These sophisticated computer models provide plausible projections, rooted in our most up-to-date physical understanding, of how the future may develop. No such model result should be considered an unerring prediction; instead, climate models are perhaps most useful when employed to test hypotheses that scientists come up with about how the real world works, and what is likely to happen if various natural or human influences occur in the future. Whatever the inevitable shortcomings of a given model, if it contains the relevant physical processes and gives the expected result, the hypothesis has at least been confirmed within the constraints of that particular model. And if multiple teams of scientists, running slightly or even considerably differ-

ent models, all hit upon similar fundamental results—that, say, temperatures will rise several degrees Celsius for a doubling of atmospheric carbon dioxide concentrations—then confidence in their estimates increases accordingly.

In short, climate models, just like empirical analyses, are tools that help advance our understanding. We need as many such tools as we can get. We should admit their flaws and imperfections, and that's precisely what modelers do. But we shouldn't throw them out, any more than we should throw out empirical studies. As Kerry Emanuel told me in May 2006:

> I try to tell this to my students, that it's dangerous to start considering yourself a theoretician, or a modeler, or a field observationalist, because you're pigeonholing yourself, and you're restricting yourself unnecessarily. A good scientist ought to try to use any means at his disposal, and not be territorial about, "Well, I'm not going to do this because it involves modeling and I don't consider myself a modeler." You're drawing a cultural distinction that's unnecessary.

Emanuel has flown into storms, derived and transformed complicated equations, and run numerical models. That doesn't mean he has perfectly described—yet—the sensitivity of hurricanes to global warming (though he's working on it). But it does mean that he combines, in one scientist, a set of abilities we should generally expect from the scientific community as a whole.

Luckily the world hosts a broad enough diversity of scientists, with varying backgrounds and different creative ways of approaching problems, that we can usually trust them, collectively, to help us solve important issues (given adequate time, research support, and so forth). Scientists are great at doing *science,* without a doubt. But they too often fall into a trap very similar to the false theory/observations dichotomy when yanked outside of a purely scientific context and thrust into media and political debates, such as the global warming battle. In this respect, it's hard not to groan a bit over a statement by Georgia Tech's Judith Curry and Peter Webster and the National Center for Atmospheric Research's Greg Holland about how they initially approached presenting their controversial 2005 findings—showing a dramatic increase in the number of Category 4 and 5 hurricanes in recent years—to the public. They write that they consciously sought to emphasize information from the "peer-reviewed literature" in their media interviews, "although this often placed us at a considerable debating disadvantage." Of course it did. If you play by boxing rules in a kickboxing match, you're bound to lose.

After undergoing a media trial-by-fire—as journalists stampeded to cover their results, and often unproductively framed the issue around rancorous debate between two camps of scientists—Curry and her colleagues changed their view of the scientist-media-public interface. Curry in particular realized that scientific training does not contain an adequate media component, and that the scientific publication process (that hallowed "peer-reviewed literature") often deemphasizes the delivery of the most policy-relevant information. As a result, especially on hot-button issues, the public tends to want such information faster than science seems able to provide it. In such situations, scientists would be well advised to stop pretending that they're purely objective fact machines and nothing more. And they can't simply limit their statements to the peer-reviewed literature, because there's not enough there for public consumption. Rather, scientists must carefully, strategically step up to the plate and offer more general interpretations that, without betraying existing knowledge, help to contextualize it for the public and the media.

The scientists of the hurricane-climate debate ultimately did this when they jointly explained that their ongoing arguments should not distract from the pressing issue of our society's "lemming-like march to the sea." By then, however, journalists—with little else to cover in the face of little newly published science—had amplified personal battles and honed in on scientific disagreements, rather than writing more policy-oriented stories that would have helped to set the developing knowledge in context. Some scientists helped fan these flames by publicly attacking each other. But the scientists' bigger mistake—one for which they cannot simply blame the media—lay in allowing the hurricane-climate issue to be framed around scientific uncertainty and contentious debate, rather than around common ground and solutions. And that framing failure, in turn, traces back to scientists' too frequent unwillingness to step outside a narrow, technocratic mode of discourse and explain more broadly why it is that their results matter.

That's why all scientists working in controversial areas—and who knows what tomorrow's controversy will be!—should pay attention to the hurricane-climate battle and learn from it about how to proceed in such fraught contexts. Scientists mustn't allow their fields of research to become polarized along disciplinary or methodological lines. And they mustn't let fights over how to interpret the latest findings—fights that will eventually get resolved—distract the media and public from the big picture.

In order to achieve these goals, however, scientists are going to have to stop being *only scientists,* and realize that they must be communicators—and leaders, and examples—as well. Scientific institutions, especially universities but also overarching scientific societies, must take steps now to train future researchers so that they can survive a "fall from the ivory tower" (as Curry would later put it). As the controversy over the dramatic 2005 studies by Kerry Emanuel and by Webster, Curry, and Holland—both showing an apparent, alarming trend of hurricane intensification—amply demonstrates, scientists have tremendous power, simply by publishing certain findings at certain times, to drive public discourse and shape societal decision making. And yet too many of them cling to the notion that their job is merely to put the "facts" out there, and nothing more—and then the facts will speak for themselves, and we'll all be better off because of it.

They won't, and we won't, either. Rather, those "facts" will get spun by advocates with opposed interests, attacked by politicians, and even suppressed by agenda-driven government agencies. Scientists can (and should) complain about this, but at

Is This Article on Conspiracies Part of a Conspiracy?

In the world of conspiracies, Elvis is alive, Paul McCartney is dead, and the government that couldn't prevent the 9/11 attacks continues masterminding elaborate, highly complex schemes.

CHRIS VOLKAY

Forty-three years after that Friday in Dallas, JFK is still the victim of a massive conspiracy, Elvis is still alive and presumably eating chocolate-covered fried chicken, and Paul McCartney is dead.

For those who don't know, Paul supposedly died in an automobile crash in 1966 and was replaced by a double. The new Paul—or "Faul" (for "Fake Paul")—has been impersonating him for, lo, these many years.

One Web site, at www.uberkinder.5u.com/paul/, not only has all the usual clues from the Beatles's album covers and music but compares voices and superimposes pictures of Paul at various times during his career to contrast noses, chins, bone structure, etc. There really is a lot of evidence to support the theory that McCartney is dead. The idea is presented cogently and backed by mountains of evidence. Like so many theories, it is neat and plausible, but, nonetheless, wrong.

The reason conspiracy theories are such an important subject is that we exist in a world awash with them: Kennedy, the origin of the AIDS virus, our supposedly faked moon landing, the death of almost anybody famous (Lennon, Princess Diana, John Kennedy Jr., Elvis, etc.), the government being involved in inner-city drug conspiracies, and on and on it goes. But some might inquire what difference it makes if people believe in cloyingly clever canards? We dwell in a world where fairy tales and fictions are already the norm. According to articles I've read, 70 percent of the public believes that there was a vast conspiracy to kill JFK, 80 percent believes in the existence of UFOs, and approximately 95 percent believes in supernatural beings such as ghosts, gods, devils, angels, and poltergeists.

In effect, everything in the world of conspiracies is the opposite of what it is in reality. Paul McCartney, who is really alive, is dead; Elvis, who is really dead, is alive. Since so many people saw JFK being fatally injured, you can't say he's alive, so they go for the next best thing: massive conspiracy. Whatever is . . . isn't. Whatever reality you don't like, you can change with the handy eraser on the end of your pencil-like head.

So what difference does it make? I maintain that one of the reasons the world is in the jolly shape it's in is that we have many people believing in and, more significantly, acting upon things that are simply not true. When we believe in fairy tales, we keep ourselves timorous children. We lose our individual strength and begin looking to things outside of ourselves for that strength and guidance.

Let's look briefly at the most famous conspiracy theory, JFK's assassination in Dallas. [See also Massimo Polidoro's column "Facts and Fiction in the Kennedy Assassination," SI, January/February 2005.] Seventy percent say it was a conspiracy. This makes not believing it was a conspiracy seem naïve, gullible—well, let's face it, downright jug-headed.

Much is made of the grassy knoll, located in front and to the right of Kennedy when the shooting occurred. Many people have opined that the shots came from there. Oliver Stone, in his movie *JFK*, suggests that the horrific head shot that killed Kennedy came from there.

As a young boy, my father took me out hunting probably hundreds of times. I shot hundreds if not thousands of animals (something I no longer do). All of the animals that met their deaths from my gun (deer, rabbits, squirrels, birds) died the same way: small holes where the bullet entered, perhaps a minuscule trickle of blood, and, if the bullet hit bone, massive, craterlike holes in their bodies where the projectile exited. It's simply a case of physics. No bullet ever made has the ability to tear large holes where it enters; it can only create them where it exits. This is because the bullet is intact when it enters and then explodes or fragments upon hitting bone.

In effect, everything in the world of conspiracies is the opposite of what it is in reality. Paul McCartney, who is really alive, is dead; Elvis, who is really dead, is alive.

And the same is true of the bullet that struck JFK. As anyone who has ever hunted could tell you, the head shot that took the front right part of Kennedy's head off could have come only from behind. There is no other possibility, so scratch the grassy knoll.

The second area of doubt I would like to broach is the following, which I have never, by the way, seen addressed or answered in all my years of reading about the Kennedy case. If Oswald was part of a grand conspiracy and was ordered, commissioned, and paid to execute the president, is the method of getting a job in a building and then hoping you get lucky with the target actually driving by a viable hitman strategy? Obviously, Oswald didn't go to Kennedy—as all other hitmen do; Kennedy came to Oswald. Does this really sound like a conspiratorial plot to you? Or does it sound like what it was, not a crime of *conspiracy* but a crime of *opportunity*?

By the way, Kennedy wasn't scheduled to go to Dallas until just a couple of days earlier. His staff made a last-minute change for him, so he could go stumping (i.e., campaigning) for Democratic congressional candidates. Nowhere in the years since the shooting have I ever read or heard that anybody has ever suspected Kennedy's own inner staff of setting him up. They question every other aspect of the case from A to Z, but I don't know of anybody, official or unofficial, who has suspected the staff within the White House of being part of a grand con-

Chris Volkay wrote "Bigfoot, Pluto, and ?" in our January/February 2007 issue.

spiracy. His being rescheduled for a visit to Dallas was just one of those things that comes up all the time in politics.

The thing that caught my attention about the McCartney conspiracy case was that it had so much detail, just like the Kennedy case. There are literally hundreds of pieces of "proof" that McCartney is dead. His height changing in different pictures, voice analysis, picture analysis, and on and on. As with the Kennedy case, there are endless pieces and tidbits here and there that can be combined to make it *look* like a strong case.

Anything, anywhere or anytime, can be made to look like a conspiracy, if that is what your agenda is at the outset.

However, anything, anywhere or anytime, can be made to look like a conspiracy, if that is what your agenda is at the outset. There are such things as inductive and deductive reasoning. In deductive reasoning, you start with a premise or hypothesis (e.g., Kennedy's assassination was a conspiracy) and then you look for all the pertinent information, modify it to suit your hypothesis, and throw out all that doesn't fit.

It's what we use in our adversarial legal system. One side scours for what it wants to find and so does the other, to support their diametrically opposed theories of the case. What it really comes down to is modern-day sophism; you have parties spinning theories and then finding, spinning, or cooking up evidence that supports what they want to believe. (It is, in my always humble opinion, one of the principal flaws in our legal system.) Deductive logic is by far the most prevalent way of thinking in our society. The other method is using inductive reasoning. Withholding judgment or theory, looking at all the evidence, and then formulating your belief or theory based on all of the available evidence—regardless of what you may prefer the evidence to say. This is actually one part of the scientific method.

The fact is that Kennedy was shot by Oswald acting alone. We did go to the moon. Inner-city drugs were not the result of a massive government conspiracy. John Lennon was murdered by a lone religious nut (crazy but, nonetheless, religiously motivated by Lennon's remark about being more popular than Jesus). Princess Diana was killed by a drunk driver. JFK Jr. died when he flew into dark cloudy skies without being appropriately trained to fly by instruments alone. Elvis died from too many pills and too much fried chicken. The government did not create AIDS.

And, while I'm on this subject of government conspiracies, let me add something. Unlike on TV and in films—where government agencies are often flawlessly competent—we too often see evidence to the contrary in real life.

Think about that for a minute. At the time of this writing, Osama bin Laden is still at large. The FBI couldn't find the Unabomber for eighteen years, until his brother turned him in. This is why I find it hysterically goofy when I hear and read about these great conspiracies that presumably include hundreds of people over the span of many decades. They're going to keep hundreds of witnesses, investigators, and agents *quiet* about the Kennedy case? Hundreds of people over decades? Kill the info about UFOs? There are no James Bonds here. No Moriartys, no Holmeses, not even any Watsons. No Goldfingers, either. This is the gang that said security guard Richard Jewell was the Olympic Park bomber. Grand conspiracies, folks? Ha ha ha.

In point of fact, my only *concern* involving the government in this area is that someone will plant a bomb right on top of the Statue of Liberty's noggin and the agencies will mistake it for an alarm clock. Of course, I could secretly be an op of the government hired to write articles like this to throw people off the scent. I bet I didn't fool you one bit, did I?

THE (NON)MYSTERIOUS ORBS
Continued from page 30

harder for a solution. Sure enough, closer investigation revealed that the orb was in fact a tiny piece of dust or lint that clung to the remnants of a spider web (see figure 2). It was a very unusual place for a web, and, had I not traced the long, nearly invisible line to its arachnid anchor, I would have rejected a web as an explanation. But it was a very long strand and just far enough away from the walkway that all but the tallest passersby would not run into it. It was very difficult to see, and only apparent when a dark color was held up in the air behind it for contrast—or when caught in a flash photograph.

Orbs may seem otherworldly because they usually appear only in photographs and are usually invisible to the naked eye. They are often unnoticed when the photo is taken; it is only later that the presence of a ghostly, unnatural, glowing object is discovered, sometimes appearing over or around an unsuspecting person. To those unaware of alternative explanations, it is no wonder that orbs spook them. Most ghost investigators will admit that at least some orb photos are of mundane phenomena and are not necessarily ghosts. Still, they insist, there must be some orbs that defy rational explanation, though none has yet been found. But even if that is true, no one has proven that anything but photographic and optical mechanics can create orbs.

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Fix Your Ruptured Disk without Surgery?

The Truth behind the Ads

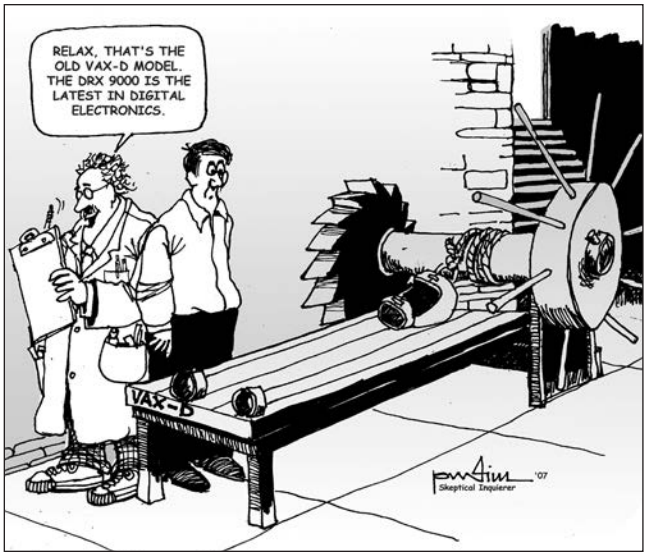
A chiropractor makes impressive claims for a device to decompress the spine; the claims fail to stand up to scrutiny, but do provide some amusement.

HARRIET A. HALL

"Space Age technology cures back pain without surgery—86 percent success rate." Ads like this have been inundating my local newspaper. I wanted to know more. I am a medical doctor, and I wondered why my medical journals had neglected to tell me about this wonderful new discovery. I sent in for the free report.

I got the report, which was followed by repeat mailings, offers of free exams, postcards, and the offer of a free one-hour telephone seminar. I listened to the telephone conference along with (allegedly) 600 other people in my area. Now I know all about it, so I can share the information with you.

The report was from a chiropractor who provides "spinal decompression" treatments with a new computerized traction



machine, the DRX 9000. This chiropractor was sure the machine worked, but he wasn't too sure what his own name was. He said he was Dan Baldwin, and his address and phone number were given correctly, but on page 6 of the report it said, "A consultation with me, Dr. Ben Altadonna. . . ."

I sent for another free report from another chiropractor's ad, and it cleared up the mystery. This almost identical report, from Dr. Frandanisa, had Dr. Frandanisa's name in the same spot on page 6. Apparently, the manufacturer provides a canned advertisement masquerading as a report for the individual chiropractor to send out under his own name, and Dr. Frandanisa took the time to read the instructions. I couldn't help but wonder if Dr. Baldwin was as careless in following the DRX 9000 treatment protocols as he was in reading the instructions in his advertising packet.

I learned from the report that NASA had discovered a cure for back pain. The absence of gravity in space relieved the pressure on spinal disks, relieved the bulge of disk herniation, and increased the height of astronauts. I didn't know NASA accepted astronauts with back pain, much less with bulging disks. I wondered what happens during liftoff and reentry, when the G-forces drastically increase the pressure on the disks. I searched the Internet and even contacted NASA but was unable to confirm the story.

I also learned that NASA uses surface electromyogram (EMG) testing to determine the cause of back pain. If NASA does, it should be ashamed of itself! Surface EMG is an unreliable, discredited test. Some chiropractors use it to hornswoggle their patients, but real doctors have declared it "unacceptable" for the diagnosis of low back pain or neuromuscular disorders (Pullman 2000).

Whether the NASA story was true or not, it seemed logical that relieving the pressure on a ruptured disk would relieve pain temporarily, but the claim was that it actually caused the disk to heal. Wouldn't that be nice? Unfortunately, it isn't true. This is an illegal claim, and such claims are disallowed in advertisements because they are not supported by scientific evidence. I guess if they disguise the advertisement as a "report" it doesn't count—freedom of speech and all that.

Disk disease is not a simple black-and-white diagnosis. Up to 40 percent of adults without back pain have herniated disks that show up on MRIs, so a positive MRI may or may not identify the cause of pain. There is a place for surgery in preventing permanent nerve damage, but too many operations are being done—often with poor results. Intensive rehabilitation may be preferable to surgery for many patients. Low back pain is a notoriously difficult problem to treat: an 86 percent success rate for any treatment would be phenomenal. I tried to track down the source of that claim. I read the references in the report and on the company's Web site, and the only real "evidence" boiled down to one single study (Gionis and Groteke 2003). It was not listed in PubMed; it was published in a throwaway publication that is provided free to doctors.

The report did not even give the correct reference for this essential study. It listed one of the two authors with all his titles (MD, JD, MBA, FICS, FRCS), misprinted one of his titles ("FICA" instead of FICS), omitted the name of the second author, gave the name of the journal incorrectly, misquoted the title of the article, and misprinted spinal as *spinla*. Another reference consisted of nothing but the name of a journal. The report was full of spelling errors, used *loose* for *lose* and included lexical gems like "it depends on your individually case." A mistake or two in an individual doctor's report would be excusable, but this report was prepared by a company with a product to sell. If carelessness about English and the facts extends to carelessness in manufacturing its machines, it may have a few loose screws—and not just in the machines.

The DRX 9000

Despite the faulty citation, I was able to find the study that the 86-percent claim was based on. It was easy to see why it wasn't published in a reputable, peer-reviewed medical journal—it wouldn't have passed review. There are so many things wrong with it that it can more rightly serve as an example of a *bad* study. A good study randomizes patients into treatment and control groups. This study had no control group, and its only randomization was that 229 subjects were "randomly" chosen from a pool of 500 with disk disease. The point of this escapes me. Part of the exam was a straight-leg-raising test: ". . . radiating pain into the lower back and leg was categorized when raising the leg over 30 degrees or less is considered positive, but if pain remained isolated in the lower back, it was considered negative." Apart from the fact that this sentence is grammatically incoherent, it is obvious that they didn't know that the straight-leg-raising test is only positive for disk disease if radiating pain occurs *above* 30 degrees and below 60 degrees.

Next I read that "Each session consisted of a 45-minute treatment on the equipment followed by 15 minutes of ice and

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interferential frequency therapy to consolidate the lumbar paravertebral muscles." Sorry, but I don't have any idea what it means to "consolidate" a muscle, and the "interferential frequency therapy" seems to be a kind of TENS (Transcutaneous Electrical Nerve Stimulation). TENS was shown to have zero effectiveness in another study (Sherry et al. 2001) cited by decompression advocates, so I fail to see why they used it here. The patients also were instructed to wear lumbar support belts, restrict activity, and take nonsteroidal drugs. You don't suppose that any of those factors could have helped relieve their pain, do you? And how many of these patients might have had resolution of their symptoms without *any* treatment? The natural history of disk disease is that "The herniated portion of the disk visible on serial MRI studies tends to heal and regress with time. Partial or complete resolution of the herniated portion of the disk over 6 months may occur in as many as two thirds of patients" (Elder and Smucker 2006). And I don't see how it can be claimed that this study supports using the DRX 9000, because nowhere in the study does it say what machine was used. I e-mailed the company and asked if they could verify that this was its machine. There was no reply.

I tried to track down the primary author of the study, Thomas Gionis. He has no studies on back pain listed in PubMed. He apparently has left medicine for law and was recently removed from his position as editor of a law review because he spent thirty months in jail on a felony assault conviction for hiring someone to beat up his ex-wife, the daughter of John Wayne, because of a custody dispute ("Law editor" 2001). In addition, he had lost his medical license and was trying to get it reinstated (Associated Press 2001). Somehow he does not inspire confidence as a medical authority.

From the ad, I learned that decompression has "no" side effects—except that it can make the pain worse and cause further disk damage! The authors admit that some patients discontinue therapy because of discomfort, and there is one report of sudden disk protrusion that occurred during treatment (Deen et al. 2003).

The manufacturers of the DRX 9000 claim that their machine is a uniquely effective product and is the only machine approved by the FDA for cervical decompression. This isn't exactly true. The DRX 9000 was given 501(k) approval by the FDA, which means that separate approval was not necessary because it was considered equivalent to a previously approved device. The previously approved device was the VAX-D, and there is nothing to show that the DRX 9000 is any more effective.

The Quackwatch Web site is a reliable source of information about questionable medical devices. Here's what it had to say about spinal decompression with the original VAX-D:

> VAX-D is an expensive high-tech form of mechanical traction that can provide relief in some cases of back pain but is widely promoted with unsubstantiated claims that it can correct degenerated and herniated discs without surgery. When the FDA cleared [the] VAX-D table as a traction device, it set limits on what the manufacturer could claim. Individual providers, provider associations, and the manufacturer itself have exceeded these limits. VAX-D therapy may provide relief for properly selected patients. However, there are good reasons to believe that manual treatment can usually accomplish the same thing more quickly, safely, and less expensively. (Barrett N.d.)

The chiropractor made a big deal out of the patented technology that applies logarithmic forces with a bidirectional motor that can change seventeen times a second, but he couldn't prove that that would make any difference. They haven't even done any comparisons between the DRX 9000 and the VAX-D. You can get a patent for anything that is substantially different, whether it is effective or not. The fact that something is patented means zilch.

In the telephone seminar, he mentioned—in passing—that deconditioning and scoliosis both cause disk disease, which is news to medical science. He said that patients with disk disease have only three options: doing nothing, having surgery, or using his machine. What about chiropractic, epidural injections, physical therapy, pain pills, massage, etc.—aren't they options, too? Isn't it strange that a chiropractor doesn't consider chiropractic an option?

I learned that decompression has "no" side effects—except that it can make the pain worse and cause further disk damage!

He talked about the cost *without* talking about the cost. He said it "varies," and insurance covers "part" of it. In reality, the cost is usually several thousand dollars, and insurance doesn't pay for anything except perhaps the original exam.

Spine-Tingling Testimonials

The chiropractor had patients call in with testimonials. One was very humorous. The caller had had pain only for three weeks, and tried decompression first because she "didn't want to get cut open or pay a lot of money." She thought she had a bulging disk because she could feel a bulge in her back! She rated her pain at 10 on a scale of 1–10—if I had maximum pain, I don't think I'd even be able to get to the chiropractor's office.

He used the old sales trick of time pressure—he said the first ten people to call from the telephone conference would get appointments, but he was too busy to see any more than that. If he's that busy, why is he advertising so aggressively?

He interviewed some potential patients/customers/victims/marks (take your choice). When one lady said she had had an epidural injection, he stressed that the relief from injections

FIX YOUR RUPTURED DISK WITHOUT SURGERY?
Continued on page 69

How to Survive the Apocalypse

With the Rapture and Armageddon soon coming, you haven't much time to prepare. Here's a survival guide for those whose skepticism and critical thinking may cost them dearly.

STEPHEN T. ASMA

According to the Book of Revelations, the Lord will eventually return to earth to carry back his devoted flock. This is the start of the end of the world as we know it. Most of humanity will be left behind. In fact, Left Behind is the name of an astoundingly popular book series by evangelical writer Tim LaHaye. More than sixty-three million copies of LaHaye's books have sold, filling the imaginations of the faithful with images of blood, judgmental vengeance, and generally triumphant ass-kicking. After the rapture, when God will suck up the devotees, he will return to earth—wearing a blood-soaked white robe—to fight the unregenerates at Armageddon.

"Armageddon" literally refers to the hill in Israel where the cataclysmic bat-

tle between the armies of good and evil is supposed to go down. In many evangelical circles, this end-time scenario has been given a specific political/cultural interpretation. For example, most fundamentalists today believe that "the Beast" or Antichrist will emerge as a charismatic Catholic leader (probably a pope), Islam will get its clock cleaned by a rebuilt Judaism, and many other such detailed predictions (see www.chick.com for the *crème de la crème*). These specific predictions should be seen as extremely helpful for those of us who will be trying to survive the Great Tribulation.

When the sky opens up and the Lord "descends from heaven with a shout" (Thess. 4:16) to separate the wheat from the chaff, you're probably going to do some serious backpedaling. You might try to justify your life, apologize for it, or perhaps even disown it. But, to be theologically precise, the time for repentance will already be over at that point; the window of opportunity will have closed, and groveling probably won't save you. It's time to think pragmatically, and you'll need some good survival strategies for negotiating the big hurt.

Why Are You in This Mess?

You're not on the A-team—in fact, you're not even in the game. Your skepticism and critical thinking have cost you dearly. Chances are that you'll want to wallow in some self-pity at this juncture, but there's no time for that now. Remember, you're in good company. Many very smart people will be damned, too—in fact there turns out to be some direct correlation there. Start working with some of these intellectuals now, before you have to run. Many intelligent people can be found near libraries and liquor stores. Forge friendships of utility. This is a good time to strategize, study blueprints and subway maps, and discuss dehydrated food options.

The Impostor Strategy

Before you become an all-out fugitive, you have two or three chances to circumvent the whole renegade thing. First, pretend to be someone else—preferably someone righteous. Do some research before the day of reckoning in order to identify some virtuous neighbor. Get the person's movements down and try to replicate her or his clothing style and some of her or his behavioral quirks. If you can hide the person when the chaos begins (maybe tie her or him up), that will also be helpful. When the angel of death swoops down to mete out justice, just adopt the other's identity and stick to your story with Oscar-winning devotion.

Now, it's true that God is omniscient and can sort out such a rigged case of mistaken identity, but the divine henchmen and middle management that you'll be dealing with won't have such cognitive powers. You're buying time here. By the time word gets upstairs to the All-Knowing One, you'll be deep into the Wisconsin hinterlands. (Of course, if God is *everywhere*, then this strategy has other problems.)

Another possible way to skirt the unpleasantries of roughing it on the road is to "kill a friend for Jesus." Try to kill some of your "heathen" friends. In fact, the closer the friend (e.g., a "best" friend), the better. Perhaps you can try to arrange this with the victim ahead of time (though he or she may find it difficult to see any personal benefit in it). Do this killing in plain view of some regular churchgoers, who can then vouch for your impressive zeal. While it's true that Jesus and the angels will be doing most of the systematic smiting, it can't hurt to demonstrate your piety with some unequivocal gestures.

Creature and Monster Management

When the sky opens up and the Lord "descends from heaven with a shout" the time for repentance will already be over at that point; the window of opportunity will have closed, and groveling probably won't save you.

During the Great Tribulation, God will unleash a lot of very large and apparently very motivated monsters upon us. First, be careful near big bodies of water. Enoch, otherwise known as Behemoth, and his companion Leviathan will be up from the bottom and looking to feed near the shorelines (Esdras 6:49). These guys are going to be sluggish at first because they've been asleep since the creation (Gen. 1:21), and that's good news for you and me. You've got the advantage as long as you stay out of really deep waters. However massive they are, these creatures are built for aquatic movement, and their big flippers, tentacles, and fins are going to be laughable out on dry land, so don't sweat them too much. But take serious precautions with the following: according to Revelations 12:3, the sky will suddenly fill with a giant red dragon "having seven heads and ten horns, and seven crowns upon his head."

If you're on your toes, you'll know *when* this red monster is on its way. A series of loud trumpet blasts will signal its coming. You need to be on the move by the time the seventh trumpet blasts because that's dragon time. Truthfully, you

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should be looking for an abandoned car or bicycle or something by the time you hear trumpet number five, for that's when the human-headed locusts will hit the scene (Rev. 9:7). And you might be thinking "Hey, I can handle human-headed locusts," but you'd be wrong. These grasshoppers will have "tails like unto scorpions" (Rev. 9:10). It will be important to loot pharmacies and carry analgesics.

You might be thinking, "Hey, I can handle human-headed locusts," but these grasshoppers will have "tails like unto scorpions." It will be important to loot pharmacies and carry analgesics.

Illustrations created by the author.

In general, locusts and giant dragons can best be evaded by going underground, at least temporarily. But don't be tempted by sewers and subway tunnels. God's not stupid, and he knows people will be heading there *en masse*. A simple wave of his hand could effortlessly double or triple the size of the rats, roaches, and stray alligators already in the city's underground systems. Don't make it easy for him. In fact, this raises an important general point. Avoid crowds and work alone as much as possible. You're a more difficult target when you're moving alone, so don't give in to the temptation to rescue fellow sufferers (no matter how attractive they are). You've got your own problems, and they'll just slow you down in the end.

Other creatures to watch out for include the "whore of Babylon" and her "scarlet colored beast" (Rev. 17:3) and "Gog and Magog" (Rev. 20:8).

Avoiding Torment

Did you know about the Human Wine Press? According to Revelations, as Jesus gathers up the unsaved, he places them in a giant wine press and squashes them into a sanguineous vino. Consequently, there's going to be a "river of blood." This presents some great opportunities for the prepared mind. How many escape-from-prison films have you seen where the cons evade detection by submerging in the river and breathing through a hollow reed? 'Nough said.

Alternatively, depending on how deep and wide it will be, a fast-moving river of any fluid can be good transport when roads have become choked with charnel remains. And don't forget that bloated dead bodies can be strung together as a makeshift raft.

In addition to such factory mechanics as the wine press, God will be looking for some deeply personal ways to afflict you. We all know what he did to Job. Severing your own ties to family and friends will help deny God the classic torture technique of "targeting the loved one." If Job had been smart enough to not love anybody, he would have been unfazed by the blights visited on him.

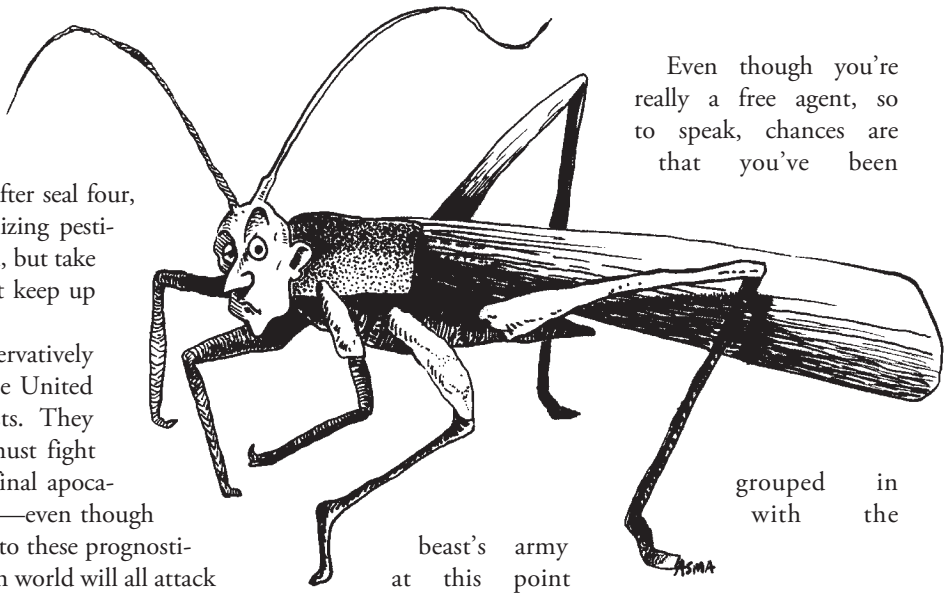
Also, keep clear of disagreeable, torturous predicaments like spirit possession and burning sulfur.

The Four Horsemen of the Apocalypse

Avoid entering into a discussion with the horsemen about various interpretations of the *White Album*. They're looking to do some smiting, and your clever queries about *Helter Skelter* will just put you high on their to-do list. The first horseman arrives when Jesus, who has morphed into a lamb at this point, breaks the first seal on a giant end-of-the-world book (Rev. 6:1–8). It's not clear *how* he actually breaks the seal, since ungulates don't have hands. One suspects that the lamb will have to either chew it off or nudge it off with its nose, and that means extra time for your getaway. The awkward scene of a lamb-Jesus chewing off a book seal might draw you in, but don't tarry—the horsemen are quick to follow. The first horse

and rider are white, and most exegetes agree that this symbolizes war. The second is red and symbolizes revolution. The third is a black horse and rider, symbolizing famine. And finally, after seal four, we have a pale horse and rider, symbolizing pestilence. These will certainly slow you down, but take courage. Most of these characters cannot keep up with a good motorcycle.

Many of today's evangelicals (conservatively thought to be fifty million strong in the United States) have become Christian Zionists. They believe (based on Ezekiel) that Israel must fight and win a war in order to trigger the final apocalypse, so they side with Israel politically—even though it's for metaphysical reasons. According to these prognosticators, Russia, Germany, and the Muslim world will all attack Israel and spark World War III. With God's help, Israel will prevail and attain peace and security. But that's exactly when the serious decline will begin. The "Beast" will begin to rule the world at this point (Rev. 13). And while most scholars agree that the original meaning of the Beast during the first century C.E. (when Revelations was written) was certainly the pagan Roman Empire, today's evangelical cognoscenti are convinced that the Beast will come as the Catholic pope. Satan himself will possess the pontiff, giving him unparalleled powers.



Even though you're really a free agent, so to speak, chances are that you've been grouped in with the beast's army at this point

How should you handle all this political drama? It may seem confusing at first, but anyone with even a streak of expediency will feel which direction the political wind is blowing and then simply turncoat accordingly. A word to the wise for the near future: stay out of any German-Russian-Muslim coalitions, alliances, or clubs until this whole thing blows over.

The Mark of the Beast

The pope is transformed into the Beast when Satan possesses him and begins to require all humans to be marked on the forehead with the sign of the Beast. The text is unclear here. In some translations it appears to be an automatic, nonoptional branding of 666 on your forehead, whereas other passages suggest that you "opt" for the branding because "no man might buy or sell, save he that has the mark" (Rev. 13:16). There's going to be an interval now in which the Beast rules over the earth. I recommend getting "the mark," even if it's only optional. After all, you're going to need to do some bartering, selling, and buying in order to stockpile supplies for a variety of tribulations. A good snowsuit, for example, could do wonders against the human-headed locusts. When you're on the run, it's good to know that your currency will be accepted.

Armageddon

According to evangelical wisdom, the pope-Beast will retreat to Jerusalem and dig-in with his evil army to meet the approaching "wrath of the Lamb" (Rev. 6:16). Jesus and Satan will do the final battle here at the hill of Megiddo.

(unless your "impostor strategy" actually worked—see above). The heat of battle can be used as a distraction while you slip out of your Satan uniform and into some pilfered God fatigues. When Jesus hurls the Beast into "the lake of fire burning with brimstone," you'll have to crawl under a few dead bodies and lay motionless. This is because all the Beast's armies will now be chopped up, and their bodies will become food for the many circling birds of prey (Rev. 19:21). Get deep under some bodies, or you're going to get some nasty pecking injuries.

When the feeding frenzy clears, make your way to wherever the Final Judgment is taking place. It should be easy to spot—Jesus will be sitting on a great, white throne. Try to blend in with the righteous.

The Book of Life

After the Armageddon victory, Jesus will sit in judgment to decide if a person goes on to heaven or burns in hell with the Beast. Apparently, there's a big "Book of Life" in which the names of the pious are written down. Don't get excited . . . you're *not* in it. But do not panic, there's room to work here—just get in the queue. First of all, it's going to be sort of embarrassing to get to the front of the line and realize you've got a big 666 on your forehead. But bangs are always fashionable and won't trigger suspicion to boot, so comb down the locks and chin up.

When Jesus looks you up in the Book of Life, act totally outraged and indignant at the discovery of your omission. When he replies that there's no mistake and that he omnisciently sees your unsaved status, ask him why on earth an

A Welcome Compilation of Classic Critiques

ANGELO STAGNARO

Paranormal Claims: A Critical Analysis. Edited by Bryan Farha. University Press of America, Lanham, Maryland, 2007. ISBN-13: 978-0-7618-3722-5. 185 pp. Softcover, $27.

Paranormal Claims is a collection of classic articles written by the pioneers of the critical-thinking and debunking communities. Considering the recent onslaught of pseudoscientific, pseudoreligious, and pseudomystical nonsense in our bookstores and on television, this book is a refreshingly logical breath of fresh air.

Bryan Farha, the editor of this collection, is a professor of behavioral studies in education at Oklahoma City University and a scientific and technical consultant to the Committee for Skeptical Inquiry.

Coincidently, the day I received this book in the mail, a friend alerted me to the imminent publication of the most self-serving and self-congratulatory piece of twaddle I'd ever come across. The author chronicled the "channeled conversations" of twenty long-since-dead celebrities in what I can only describe as an afterlife version of a supermarket tabloid: an "after-loid," if you will. If I might quote from Carl Sagan's article, "The Fine Art of Baloney Detection," which sets the tone for Farha's book:

> How is it, I ask myself, that channelers never give us verifiable information otherwise unavailable? Why does Alexander the Great never tell us about the exact location of his tomb, Fermat about his Last Theorem, John Wilkes Booth about the Lincoln assassination conspiracy, Hermann Goring about the Reichstag fire? Why don't Sophocles, Democritus and Aristarchus dictate their lost books? Don't they wish future generations to have access to their masterpieces?

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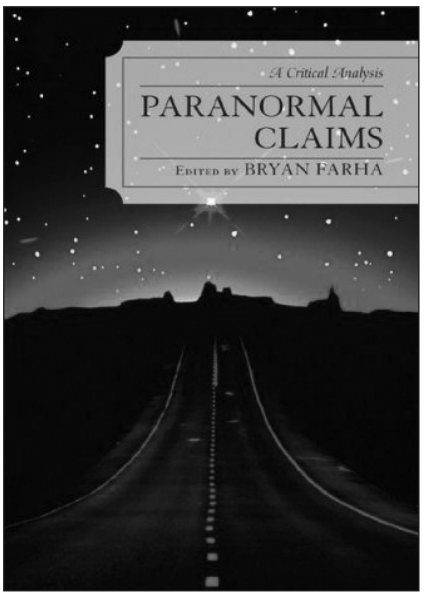


In contrast to sensationalist drivel, Farha's book is a compilation of serious, scientifically and logically grounded articles—balm for the mind. It's a concise *vade tecum* in our struggles against those who refuse to see logic, those who falsely claim the mantle of science, or those who use religion or mysticism to intentionally dupe others for personal gain.

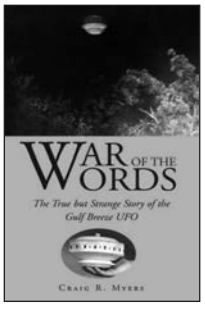
The critical-thinking articles in this book outline arguments designed to confound and refute the exaggerated claims of cryptozoologists, UFOlogists, astrologers, psychics, medical charlatans, numerologists, and other clerics of occultism. In the struggle to help bring about clarity of thought to the unwilling or incapable, this informative and convenient collection of the most important articles in critical thinking serves as a refresher to those who hope to debunk charlatanism and junk science. For those unfamiliar with some of these articles, this collection is a good introduction to the topic. Ray Hyman's classic article on cold reading, "How to Convince Strangers You Know All about Them," is one of my favorite pieces in the collection. It's not always easy to find classic articles on critical thinking. Considering my own recent misadventures in searching for such articles, I'm grateful for this collection.

The book contains articles on a variety of topics, but the editor included several more articles on medical quackery in comparison to other sections—something that is important. Too many people who are otherwise vigilant against believing claptrap such as "luck" or "psychic abilities" have fallen prey to the claims of alternative medicines.

Paranormal Claims comes with endorsements from Ken Frazier, James Randi, and Ann Druyan, which speaks volumes (excuse the pun), for the importance of this book. Admittedly, it would have been wonderful to have included an article by Martin Gardner, the gray eminence of the critical-thinking community, but this anthology easily stands upon its own merits with contributions from scholars including Susan Blackmore, Michael Shermer, Stephen Barrett, and Geoffrey Dean.

Farha includes three of his own articles and several more from James Randi.

One more pleasant surprise awaits the reader who picks up *Paranormal Claims*: while his name does not appear on the book's cover, Michael Shermer wrote the foreword for this anthology.



A Model UFO Debunking

ROBERT SHEAFFER

War of the Words: The True but Strange Story of the Gulf Breeze UFO. By Craig R. Myers. Xlibris Publishers, Philadelphia, Pennsylvania, 2006. ISBN-13: 978-1-4257-1654-7. 192 pp. Hardcover, $30.99; softcover, $20.99.

Given the current bear market in UFO conferences, books, and magazines, it seems odd that someone would publish a book detailing one, single UFO case, albeit an extremely important one. That is doubly true when the book is written from a skeptical perspective. But, nonetheless, that's what we have here, and while such a book is not likely to make any best-seller list, it's a valuable contribution to our understanding of the contemporary UFO mania.

The first Gulf Breeze UFO photos were published, anonymously at first, in *The Gulf Breeze Sentinel* on November 18, 1987. These were soon followed by many others, most of them looking laughably bogus, with the *Sentinel* playing the role of chief UFO booster. It didn't take long for the identity of the photographer and chief UFO contact to be revealed as local contractor Ed Walters. Author Craig Myers is a reporter for the rival *Pensacola News Journal*, and seems to enjoy needling the competition's uncritical, even sensationalist, reporting.

Assigned by the *News Journal* to do a special report on the UFO hysteria, Myers recounted how UFO buffs would gather at Shoreline Park, near the Pensacola Bay Bridge. Often, they would see a red UFO nearby, which some attributed to a lighted kite, possibly being pulled by a boat. This is where Walters claimed to have discovered several circular UFO landing pads while being interviewed by Myers's colleague, who later said, "It looked like someone just trampled down the weeds or something." Ultimately, the UFO issue became very divisive in the community, and Myers gives us an insider's view of the controversy. In 1990, Walters used his new fame to launch a bid for the Gulf Breeze City Council. Out of a field of nine candidates, he came in "dead last."

Anyone who is undecided about the Gulf Breeze claims or who may have been swayed by Bruce Maccabee's pro-UFO analysis needs to read this book. Myers recounts in full detail how the case unfolded, where the battle lines were drawn, and who fired what salvo from what position. MUFON, the largest UFO group in the United States, took an unambiguously pro-Gulf Breeze position. When facts should have gotten in the way of that position, the facts were ignored. MUFON held its 1990 convention in Gulf Breeze to capitalize on the excitement.

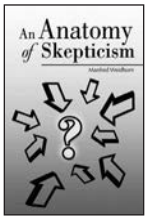
Myers was the reporter who interviewed the people who had moved into the house where Walters had been living at the time of his first UFO photos. They found a model UFO, apparently tossed up in the attic, made of styrofoam plates and such. "It was the Gulf Breeze UFO," writes Myers, and he now held it in his hands. Later, Myers was able to duplicate Walters's UFO photos almost exactly using the model. Confronted with the undeniable evidence, Walters claimed that the model had somehow been planted in the house by "professional debunkers" who "will do whatever [is] necessary to debunk a case."

Because the book gives such an in-depth, close-up view of the Gulf Breeze controversy, the story contains many subplots. One is the amusing story of the "Doomsday Six," six members of a U.S. Army intelligence unit in Germany, who apparently belonged to some sort of end-of-the-world cult. They deserted their posts and traveled to Gulf Breeze for some purpose that was never entirely clear, apparently at the suggestion of a Ouija board!

The book reprints humorist Dave Barry's satirical essay on his own investigations of the Gulf Breeze photos, in which he recounts his conversations with Walters, who told him weird tales, such as being trapped by the UFO's paralyzing ray and of hearing strange telepathic voices. The more Barry heard about this case, the more skeptical he became. Most major UFO cases are like that—they sound impressive when one hears just a little about them in sensationalist media reports, but, upon reading the full details of what did (and did not) transpire, the differences between the "UFO incident" and "a real event" become glaringly obvious. Sometimes, Myers stretches his metaphors to the point where they seem to groan back at you right there on the page, and some of his witticisms seem too clever by half. He seems to think he can write like Dave Barry, but, unfortunately, he cannot. This distracts from the serious message of the book. Nonetheless, all reporters who are called upon to write on UFOs and other "paranormal" subjects should read this book for a solid example of hard-headed investigative journalism and proper skepticism. □

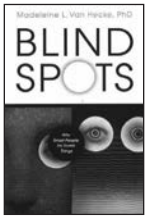
Robert Sheaffer is the author of UFO Sightings: The Evidence *(Prometheus 1998) and a regular SI columnist.*

Listing does not preclude future review.

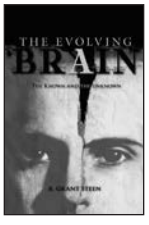


AN ANATOMY OF SKEPTICISM. Manfred Weidhorn. iUniverse, Lincoln, Nebraska (www.iuniverse.com), 2006. 429 pp. Softcover, $27.95. Although the author insists this lengthy work is not a systematic treatise on skepticism or a work of philosophy, it is a philosophical examination of skepticism in the context of life and culture. Surveying the state of knowledge in some nonscientific disciplines—religion, politics and history, psychology, literature, and words and reason—and, especially, in the "highways and byways of daily life," he finds widespread uncertainty behind the mask of certitude. Behind this undermining of convictions are, he finds, the "slipperiness of assumptions" and the "virtual impossibility" of finding truth.

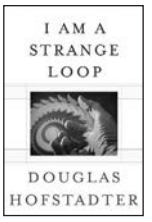
BLIND SPOTS: Why Smart People Do Dumb Things. Madeleine L. Van Hecke. Prometheus Books, Amherst, New York, 2007. 224 pp. Softcover, $18. A psychologist argues that much of what we label "stupidity" can be better explained as blind spots. She draws on research in creativity, cognitive psychology, critical thinking, child development, education, and philosophy to show how we (all of us, including the smartest people) create the very blind spots that become our worst liabilities. She devotes a chapter to each of ten blind spots, among them: not stopping to think, my-side bias, jumping to conclusions, fuzzy evidence, and missing the big picture.



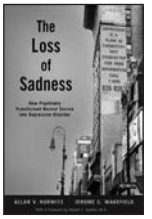
THE EVOLVING BRAIN: The Known and the Unknown. R. Grant Steen. Prometheus Books, Amherst, New York, 2007. 437 pp. Hardcover, $28. A neurophysiologist provides a crash course in modern brain science and delves into questions such as where creativity comes from and whether we can distinguish between brain and mind. Despite the brain's complexities and mysteries, it is his view that evolution can now explain the human brain in broad strokes and will eventually explain human behavior in detail.



I AM A STRANGE LOOP. Douglas Hofstadter. Basic Books, New York, 2007. 412 pp. Hardcover, $26.95. Hofstadter's first book-length discursion into philosophy and his interwoven passions of minds, brains, patterns, symbols, self-reference, and consciousness since his Pulitzer Prize–winning Gödel, Escher, and Bach (1979). The book is about the concept of "I" by a cognitive scientist whose specialty is, to the degree it is a specialty, "thinking about thinking." As in his previous books, he relies heavily on analogies, metaphors, and examples ("indeed, this book is a gigantic salad bowl full of metaphors"), and he writes in the first person, all of which greatly enlivens topics too often treated in the abstract.

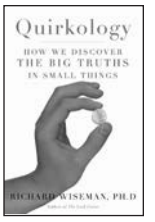


THE LOSS OF SADNESS: How Psychiatry Transformed Normal Sorrow into a Depressive Disorder. Allan V. Horwitz and Jerome C. Wakefield. Oxford University Press, New York, 2007. 304 pp. Hardcover, $29.95. There is a widespread perception that depressive disorder is growing at a rapid pace, with now ten percent of all American adults said to be afflicted with it. In this book, two scholars argue that the increased prevalence of major depression is due not to a genuine rise in mental disease but to the way that normal human sadness has been "pathologized" since 1980. That's when the landmark third edition of the Diagnostic and Statistical Manual of Mental Disorders, 3rd ed., came out. The DSM–III system is flawed, the authors say, because it ignores context. They stress distinguishing between abnormal reactions due to internal dysfunction and normal sadness brought on by external circumstances.

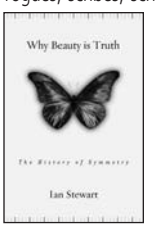


PARANORMAL CLAIMS: A Critical Analysis. Bryan Farha. University Press of America, Lanham, Maryland, 2007. 167 pp. Softcover, $27. A collection of eighteen articles—including several from the SKEPTICAL INQUIRER—involving examination of paranormal, extraordinary, or fringe-science claims. The articles are an antidote to all manner of claims and assertions that swirl about without much intelligent evaluation and response. And they'll help teach skepticism when used in courses in psychology, sociology, philosophy, education, or science. See the review in this issue.

QUIRKOLOGY: How We Discover the Big Truths in Small Things. Richard Wiseman. Basic Books, New York, 2007. 336 pp. Hardcover, $26. Noted (and refreshingly quirky) psychologist Richard Wiseman (professor of the public understanding of science, University of Hertfordshire) draws on research in psychology, including his own, to expose the truth behind life's little oddities and absurdities. Chapter topics include: What your date of birth really says about you (the new science of chronopsychology), trusting everyone but always cutting the cards (the psychology of lying and deception), believing six impossible things before breakfast, making up your mind (the strange science of decision making), the scientific search for the world's funniest joke (the psychology of humor), sinner or saint? (the psychology of when we help or hinder), and the pace of life (and "other quirkological oddities").



WHY BEAUTY IS TRUTH: A History of Symmetry. Ian Stewart. Basic Books, New York, 2007. 290 pp. Hardcover, $32.50. Well-known math popularizer Ian Stewart here introduces readers to the concept of symmetry, a vital idea hidden in the heart of the most important ideas in modern science, including quantum mechanics, string theory, and cosmology. He describes the history of the idea, introducing us to rogues, scribes, scholars, dandies, duelists, and revolutionists and describes recent discoveries in symmetry and symmetry's role in a possible "theory of everything."



—Kendrick Frazier

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This Is the Forum Column That Goes Like This

RALPH ESTLING

Dear Andrejs,

Your letter of the 18th was one of the most interesting, informative, and thought-provoking that I've seen for quite some time. Thanks very much for it. Thanks also for your critique of my proposed SKEPTICAL INQUIRER piece, "All You Could Ever Hope to Ask about the Universe but Were Too Damned Lazy to Do So," which is much appreciated and which I'll take to heart, particularly where I repeat myself or am long-winded or don't explain clearly, all very valid points that I recognize as part of my tergiversating tomfoolery.

I pretty much agree with a pretty good deal of what you say on the other things, too. But "*Cogito ergo sum*" has always bothered me as an explanation for one's existence. I've little doubt that I and the rest of the universe are here, but the notion that this fact is proven by my or anyone else's ability to think is very problematic and smacks of an irrelevant correlate, a kind of *post-hoc-ergo-propter-hoc* attempt to show a cause-and-effect relationship between an electrochemical activity that's taking place within a brain and that brain's physical reality. I think this is logic going backwards. A brain has to exist first for it to have activity going on within it. The best that Cartesian logic can come up with is "I think I think, therefore I think I exist," and even that's putting Descartes before the horse. I favor leaving out the "thinking" bit entirely and sticking to objective, inherent physicality as a "given" that only solipsistically inclined philosophers worry about.

You mention the vital necessity of imagination in the making of hypotheses, and this is spot-on. But hypotheses, if they're to be any good even as hypotheses, need both imagination and observation of the physical data. That's where science differs from art (and insanity). Einstein said that "Reason takes you to one place, imagination takes you around the world." You're quite right; we must have imagination. The point is, it must not have us. As Humpty Dumpty says, it's just a question of who is to be master, that's all. I think Einstein would have agreed that we must start with imagination but not finish with it, if we're to get anywhere, around the world or around the block.

I agree with you that there's lots of imagination in religion; no one could deny that. What's in question is the plain hard thinking. Much of what we call religion is just ethical behavior, which

"*Cogito ergo sum*" has always bothered me as an explanation for one's existence. The best that Cartesian logic can come up with is "I think I think, therefore I think I exist," and even that's putting Descartes before the horse.

Editor's note: *As this column was going into layout, we learned the sad news that Ralph Estling, who wrote thoughtful and thought-provoking Forum columns like this one for the SKEPTICAL INQUIRER over two decades, died, peacefully, at his home in Ilminster, Somerset, U.K., on July 6. He was 77. We will have more about him in a future issue.*

can be quite satisfactorily explained on anthropological, sociological, cultural, and psychological foundations, without incorporating anything supernatural. Yes, there are unknowns; there are always unknowns. The point is to try to make them known while accepting the possibility that this may be impossible. But we must not assume that unknowns must remain forever unknown just because they're unknown now.

I seem to be stating a lot of banalities, a lot of things that are self-evident. So I apologize both for the ones I've made and the rest that I'm going to make.

Yes, as you say, because so much is not known, we need models, mental creations. They are pragmatic tools, and we need them for getting the job done. And, yes, we can stop with them and still get the job done. The trouble is that they don't explain why. Of course, we can get by without knowing why, but somehow that doesn't satisfy us, or some of us. Many people are content with just getting the job done, but our ape cousins can do that much and so can a number of other species. Humans have a rather high opinion of themselves, rightly or wrongly, and, if we're to maintain that high opinion, then we must do more than chimps or dolphins; we must do more than just "get the job done." This is where imagination and plain hard thinking come in.

Yes, misuse of religion doesn't invalidate its usefulness, but that's not the point. The point is rather to use its useful bits, its ethics, and ignore what's useless, the supernatural and paranormal bits, at least until some evidence for them is found. I use the term *useless* advisedly. The supernatural is very useful, in its way. It comes in handy as a sort of nontool for getting the job done, i.e., living through one's life without asking too many difficult questions, seeking too many hard-to-get answers. It certainly has its pragmatic side. But pragmatism, while useful in getting jobs done, isn't enough. It may be for chimps and dolphins but not for humans—well, some humans.

In the meantime, I await evidence that divine or what you call superior intelligences might be out there, somewhere. Superior intelligences are certainly a possibility that must be dealt with—I can't think of anything more dismal and depressing than the possibility that humans are the greatest intelligences in the whole universe—but I have severe doubts about divinities.

In any case, I think we should make use of what intelligence we have to think as reasonably as we can. The obvious fact that there are plenty of things that are unknown is no argument for non-thought, i.e., for allowing for possibilities that have nothing going for them except for wish-fulfillment. We can't prove beyond doubt that there is no Santa Claus, no Tooth Fairy, no fairies of any sort or description at the bottom of our or anybody else's garden, or unicorns, dragons, or a million and one other "possibilities," but I don't think this is cause to be "open-minded" and ambivalent about their existence. Reason is and always will be an imperfect tool for digging our realities, but it's the best tool we have and so we might just as well use it, at least until something better comes along and, at the moment, I can't think of anything that's better or even comes close. Not knowing something with absolute certainty doesn't compel us to enter into a strict neutrality when it comes to using our head as well as our head allows. And I can't get more banal than that.

Now, just to show you what a fair-minded chap I am when it comes to being unkind to deep thinkers like theologians, philosophers, and poets, I shall now demonstrate a streak of real cruelty to scientists and mathematicians.

There was an eye-catching bit of mathematical logic in the *New Scientist* of 28 October 2006. A biologist at Leeds University writes that he's annoyed with critics because they're "taking his precise numbers too seriously," despite the fact that his figures are "of the right order of magnitude." He's writing about species extinction. "The true extent of extinctions might be between 1 and 50 percent of current species totals," he says.

Now, if we assume that there are about about 10 million species, excluding single-celled organisms, currently existing, 1 percent comes to 100,000, while 50 percent is 5,000,000. The Leeds biologist seems to think that, as both these numbers are large, they are pretty much the same thing, i.e., are of the same order of magnitude. He's not alone in thinking this way.

Mathematicians and scientists in general would probably agree with him, though your ordinary mortal might not. As you know, orders of magnitude differ from each other on a logarithmic scale, where things are measured in "magnitudes" in which a number is ten times its immediate predecessor, so that, for example, 10^9 means 1 billion, while 10^{10} means 10 billion. Mathematicians and many scientists seem to conclude that, as the exponential numbers 9 and 10 are pretty much alike, by and large, 1 billion and 10 billion are similarly very much the same thing, ballpark-figure-wise, whereas ordinary folks are more inclined to see a noticeable difference between the two: in this case, 9 billion.

Now, getting back to my Leeds biologist. The difference between 100,000 and 5,000,000 is 4,900,000, or, to put it as the biologist puts it, somewhere between 1 percent and 50 percent of all multicellular species will go extinct over the next fifty or so years. To simplify matters, he makes the total extinctions 1 million, a nice round number that's easy to remember.

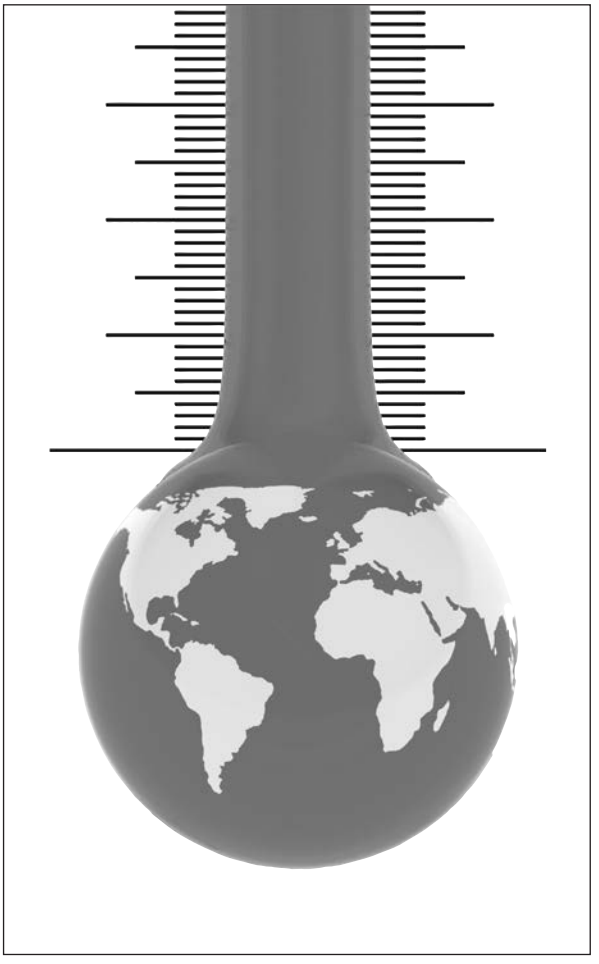
That we may well be facing the extinction of many species in the near future is of immense significance, but this significance is not helped by a method of arithmetical deduction that is almost entirely meaningless in the context in which it is applied.

Or maybe we just shouldn't take a mathematically inclined biologist's precise numbers too seriously.

Tell me what you think about all this when you get back from Latvia.

Yours,

Global Warming: Critical Reaction, Support, and Author Response



Our May/June 2007 cover article on global warming produced an immediate storm of critical reaction. And this was before Part 2 of the article appeared in our July/August issue (as mentioned in the Editor's column in that issue). Most of the letters came from readers doubtful about either global warming itself or that it is caused by human activity (anthropogenic global warming, or AGW). In this special Follow-Up section, we print a representative selection of those letters, followed by several letters supportive of our coverage, then a fairly detailed response by NASA scientist Stuart Jordan, the author of the original article. We will continue to address this matter—not just disputes over the science but the public perception and ideological aspects of the controversy—as conditions warrant.— Editor

From Global Warming Critics: Be More Skeptical of Warming

Shame on you and the Skeptical Inquirer for touting the IPCC's Fourth Assessment Report as science. Scientists do not prove theories right or wrong by assessing and evaluating published research to arrive at a consensus. They do serious experiments, debate results, and do more experiments until the evidence overwhelmingly presents a conclusion that additional research confirms. Nothing of the sort exists for so-called global warming. I have written to your subscription office to have it cancel my subscription. You are not skeptical enough for me.

Jon Titus
Herriman, Utah

In this issue, I find an editorial, a lengthy summary of an IPCC report with an introduction by the editor, and a major exposition by S.D. Jordan (with a promise of more to come) on the subject of global climate change. All emphasize the likely catastrophic effect of an increase in the global temperature.

This raises two important questions in my mind: Has the Committee for Scientific Inquiry succumbed to the "madness of crowds" and accepted the "popular delusion" that the global climate is changing and these changes will result in catastrophic global effects? Why has the CSI chosen to become an arbiter of this scientific controversy by publishing this material, especially a "position paper"?

As a retired meteorologist, a longtime supporter of CSI, a longtime reader of SI, a scientist, a skeptic, and a "denier" that our current state of knowledge enables us to predict world conditions for a century or more, I am deeply disturbed by the contents of this issue.

Thomas B. Gray
tgray80@comcast.net

I've admired Skeptical Inquirer since I was in high school two decades ago (and wrote an article criticizing alternative medicine for it), so I am dismayed to see your new D.C. office pushing the global-warming scare.

Few people—not even some climatologists, unless they are good statisticians—appreciate how weak the original data is from which the politicized IPCC weaves its doomsday narrative (from shaky CO_2/heat correlations to shakier average-global-temperature/ice-cap-melting correlations, not to mention chronically failed storm and sea-

level-rise predictions).

Current climate models (applied retroactively) don't even predict the ice ages, the biggest climatological variation on our planet. The models are endlessly tweaked yet still fail to have predictive power—not pseudoscience, perhaps, but a young and flawed science unfit for making drastic policy prescriptions.

As bogus cancer scares and the like teach us, weak correlations can be trumpeted as signs of doom by people who turn the ambiguous original data into press releases, news stories, and political policy agendas. Pronouncements framed as the "final" word of the scientific establishment can be (and all too often are) built on faulty statistics—and are all the more insidious for coming from esteemed bodies instead of from psychics and blatant crackpots.

Todd Seavey
New York, New York

I am very disappointed in your non-skeptical approach in your global warming article. The skeptical approach is to look at the scientific information available and determine if there is a clear answer. Instead you use an author with a clearly biased viewpoint who presents virtually no scientific information.

I have spent quite a lot of time researching the issue. My conclusion is that (1) the "consensus" has been manufactured by ignoring all the dissenting scientists, and (2) global warming seems to be due to solar input. I have written a document summarizing my findings (it can be found at www.appinsys.com/globalwarming). The main findings:

Part 1: The current temperatures are not unprecedented.

Part 2: The science behind Mann's hockey-stick graph (that got the hype going) was very flawed.

Part 3: There are problems with the way "global" temperatures are measured.

Part 4: The U.S. has not warmed to an abnormal extent, and there is no effect on hurricanes or tornadoes.

Part 5: Solar radiation has been increasing (also, deforestation and meat production are greater contributors to CO_2 than transportation).

Part 6: Blaming warming on anthropogenic CO_2 is politically based, not science-based.

Those scientists that are blaming global warming on anthropogenic CO_2 seem to do one of two things: (1) if they are working with historical data, they choose a starting time that exhibits an upward trend and ignore other starting times that produce different results, (2) work with theoretical models that are then extrapolated beyond the range of understanding or assumptions used in the model.

Alan Cheetham
abcheetham@hotmail.com

As a subscriber to Skeptical Inquirer for over a quarter of a century, I am greatly disappointed in the recent article "Global Warming: A Position Paper." It seems to be a rehash of the latest IPCC report, which was not written by scientists but edited by government and NGO bureaucrats.

The article is littered with phrases like "alarming rise," "the probability is extremely high," "it can be said with confidence," and "These systems can respond in hard-to-predict ways." This is a scientific paper? There is not a single piece of data nor a single graph in the document, reminding me of Al Gore's "Convenient Fiction" movie showing plots with no scales and CO_2 vs. temperature plots where the CO_2 scale has been magnified twenty times so that the two cycling plots appear to be the exact same size.

In the paper, Mr. Jordan gives a passing "balance" to the skeptics by mentioning several weak objections and then proceeding to demolish them without addressing the really serious objections. He fails to mention the fact that the ice caps on Mars are receding, indicating that solar flux, indeed, may play a dominant role in determining the temperature of the planet. He ignores researchers like MIT climate scientist Richard S. Lindzen, who argues that clouds and water vapor will counteract greenhouse-gas emissions.

While there are indeed some parts of the planet that are warming, there are also others that are cooling, and it's not even clear what a "mean global temperature" is.

There is not a shred of evidence linking the present global warming to anthropogenic causes. On a more basic level, the arrogance needed to hold the global warming view is amazing.

I do not wish to support any organization that is part of the irrationalism of anthropogenic "global climate change" and the accompanying political agenda. Please cancel my subscription immediately and forward me the prorated balance.

James E. Libby
Chandler, Arizona

Regarding Stuart Jordan's paper on global warming, I have two problems. First, there is Kendrick Frazier's introductory "Editor's Note," which says: "Might the warming be caused . . . by the sun? No." Second, Jordan states: ". . . there is no evidence that the sun is responsible for current global warming. . . ."

To start, Henrick Svensmark, director of the Centre for Sun-Climate Research at the Danish National Space Center, puts forth an excellent argument that global warming is primarily caused by solar activity, and Habibullo Abdussamatov, head of the Russian Academies of Sciences Pulkovo Astronomical Observatory in Saint Petersburg, points out that Mars is undergoing a warming trend with its polar ice caps shrinking *without* (as far as we now know) human involvement.

I do not believe that you or Mr. Jordan should summarily reject these opinions. There's an excellent chance that they are right. (For what it's worth, I believe they are.)

The comments of these two scientists can be read at the Web site of the *National Post*, a Canadian publication out of Toronto, available at www.canada.com/nationalpost/. The *Post* has an ongoing series called "The Deniers," which currently contains nineteen articles of interest.

Another must-see site is http://independent.org/newsroom/article.asp?id=1945. This contains an article by atmospheric physicist S. Fred Singer, professor emeritus of environmental sciences at the University of Virginia. In the article's first paragraph, clicking on "The Great Global Warming Swindle" allows you to view the 1 1/4 hour program broadcast in Great Britain in March. This is must-see viewing for everybody.

Also, see a May 15 news release from the U.S. Senate Committee on Environment and Public Works entitled "Climate Momentum Shifting: Prominent Scientists Reverse Belief in Man-made Global Warming—Now Skeptics." This lists thirteen credible scientists and their opinions.

Heeding a release on global warming put out by the United Nations is like heeding a release on evolution from the Pentecostal Church. Could it be that the only one withholding skepticism on this subject is the Skeptical Inquirer?

John Colling
Northville, Michigan

I am surprised to see the Skeptical Inquirer abandon its skepticism and completely endorse current popular theories about global warming. There is no doubt that global warming is occurring and that average temperatures are the highest in one thousand years. And there is no doubt that

climate change can be locally catastrophic—just visit Palmyra in Syria and try to visualize how and why disaster occurred there (over one thousand years ago).

Where skepticism is needed is in identifying the cause. The current warming started in the early 1800s, when the climate was at a "cold spot," and it has proceeded at a very steady pace since then. Thus, at least half of the current warming occurred before automobiles and industrial greenhouse gases were significant. We should be cautious in this matter and skeptical of putting all our belief in one possible cause. Abating greenhouse gas emissions may well help, but it is unlikely to be the cure-all—and it might not help much at all. True skeptics believe that climate behavior is still more mystery than science.

John R. Rice
West Lafayette, Indiana

For the very first time, the SKEPTICAL INQUIRER has disappointed me. In this period of mass hysteria about global warming, it was not necessary to fuel the alarmists' arguments with new articles about the subject (SI, May/June 2007).

It is not surprising that the text on pages 6–7 is alarmist, as this text comes from the IPCC itself. It is as if you asked the pope his opinion about the existence of God—of course, we would know his reply in advance.

How can the alarmists of the IPCC explain the Medieval Warm Period, when it was warmer than presently, though there was still no real industrialization? At that time, solar activity was high. Later, the Maunder minimum of sunspots coincided with the Little Ice Age, and the present higher temperatures coincide with higher solar activity. For me, this is a sufficient indication that the climate is highly dependent on sunspot activity, not on the CO_2 contents of the atmosphere.

On page 4, you refer to today's "remaining" global-warming skeptics. My own impression, however, is that the number of those "remaining" skeptics is increasing! Al Gore has exaggerated, and now comes the reaction.

Jean Meeus
Kortenberg, Belgium

I was very disappointed in the cover article on global warming. I would have expected some skepticism about the many vague and misleading statements in the article (after all, this is the SKEPTICAL INQUIRER!). I feel I have to say something about at least some of them.

The article is blatantly unfair in its discussion of the possible effects of global warming, starting with the fact that it claims that harmful effects are "known" and beneficial effects are only "possible." None of the "possible benefits" is given a fair treatment, and some are not even mentioned; for example, there are many more cold-related deaths each year than heat-related deaths worldwide, so warming would be a net benefit there. And you would think it could be mentioned that during historical and prehistorical times warm periods have generally been associated with flourishing societies and cold periods have been associated with bad times and collapsing societies. Ironically, the one real example of "catastrophic climate change" that is given in the article is a cold period, the Younger Dryas. I would say that all available evidence points to cold periods being much more worrisome than warm periods.

The author is only appropriately skeptical about possible beneficial effects and throws skepticism to the wind when discussing possible harmful effects. One of the most annoying examples is the discussion of rising sea levels, where possible rises of twenty-two feet from melting of Greenland and 200 feet from melting of Antarctica are mentioned, without any indication of the time scales involved. The scientific consensus is that it would take several hundred years for a sea-level rise of even twenty-two feet, which is hardly an imminent catastrophe. Of course, there are individuals who worry it could happen faster than that, but since when is the SKEPTICAL INQUIRER credulous about scary scenarios without firm scientific backing?

Michael Wilson
Albuquerque, New Mexico

Reaction Supporting Our Coverage: Be More Skeptical of Warming Deniers

It was great to see a good discussion of AGW (Anthropogenic Global Warming) science, but SI needs more study of the organized pseudo-skepticism here. It is structurally different from most SI-covered topics, in a way that can easily mislead SI-style skeptics. Many are two-way fights, where one group has an unshakable belief supported by changing pseudoscientific arguments, opposed by rational skeptics using science. Skeptics often hear extreme beliefs, apply Carl Sagan's "Extraordinary Claims" rule, assume the beliefs are unlikely and that the group critical of those beliefs is more likely correct, and, if they care, study the issue more deeply.

But, AGW is different; a three-way fight: nonskeptics, rational skeptics, and a second set of non-skeptics. The first group consists of "alarmists," who believe, for various reasons, that humans should return to a less-industrial economy and seized on early AGW ideas, in advance of strong evidence. Tales of doom have been used for fundraising for NGOs. I read a book describing the Arctic in the year 2100, and saw, "You search in vain for the seals, walruses, and penguins that used to live here in large numbers." Arctic penguins? That made me doubt AGW for a month, all by itself.

The second, well-informed rational skeptics, include climate scientists and anyone else who has taken the (substantial) time to carefully study the evidence. Over several decades, mounting evidence and understanding have convinced such people that AGW is real and will cause real problems, without going to the extremes of alarmism.

The third group is the "denialists," whose unswerving goal is to stop any action on AGW, and work back into obfuscating AGW science with well-practiced tactics. Denialists love to be called skeptics (they aren't), and they label everyone else as alarmists, including climate scientists (they aren't). Quite often, SI-style skeptics new to AGW get so irritated at the alarmists that they end up getting psychologically "anchored" into denialism—its opposite.

Think: how likely is a worldwide conspiracy of almost all climate scientists and editors of top journals to fake AGW? Is that more likely than getting misinformation about AGW from members of a K Street lobbying organization sometimes funded by ExxonMobil and run by an ex-American Petroleum Institute executive?

Your Editor's Note was sadly unskeptical of "global-warming skeptics." Some run well-financed, well-organized, well-coordinated efforts to propagate disinformation, and few currently contribute anything useful to climate science, even if a few once did decades ago. They are happy to be given a free pass as skeptics. Please don't hand it over.

If people parroted creationist arguments directly from the Discovery Institute, would you call them "evolution skeptics"? If people obfuscated the science of the smoking-cancer link, using RJ Reynolds misinformation, would you call them "tobacco-cancer skeptics?" I think "denialist" (or "denier")

fits much better. An AGW-denialist is as likely to accept evidence for AGW as the DI is to accept that for evolution. The vocal AGW-denialist "industry" churns out reports, op-ed pieces, articles, letters-to-editor, TV shows, and does lobbying but little or no peer-reviewed research—just like the creationist industry.

Even a normal skeptic can get misled (I was, for about six months!), as much of this sounds plausible. It is always easier to sow confusion than create clarity. If one's earliest AGW exposure is such, it is easy for someone to get "anchored" there if they aren't careful. People may believe (or profess belief) something about science but for non-scientific reasons like economics, politics, ideology, or philosophy. Denialist misinformation often plays to those other reasons.

Economically, there is zero benefit to oil or coal companies in CO_2 restrictions. If people are told that AGW science means that their living standard will go down, they may well disbelieve the science. Politically, if either George Bush or Al Gore said "The Sun rises in the East," some people (different groups!) would be looking for the Sun in the West . . . but that's not really a good way to do astrophysics.

Normally skeptical people (including scientists/engineers outside their discipline) seem especially susceptible to being misled by the AGW-denialist industry. Why? Alarmists irritate real skeptics, as in the vanishing Arctic penguins. Movies like *The Day after Tomorrow* don't help. But alarmists being wrong doesn't make denialists right.

In fact, over the last twenty years, real climate scientists have moved from thinking AGW might be happening to thinking it is very likely and being able to better quantify the effects. This field has progressed tremendously in those decades, of course, with the usual back-and-forth jiggles as hypotheses get confirmed (or not) as more data arrives.

A skeptic should distinguish between classic alarmists and credible climate scientists who have spent decades of careful study and now say that the evidence for AGW is very strong and that basic physics makes continued temperature rises very likely for many decades to come. The AGW-denialist industry tries hard to conflate classic alarmists with world-class scientists, to use the irritation at the former to weaken the conclusions of the latter.

After I got interested in AGW (in late 2001), I averaged about an hour a day for several years reading books from all viewpoints, got the full IPCC volumes, tracked down primary research articles, and watched videos on the web. I started with AGW-skeptic books and actually thought they made sense, but, over time, I learned better. For instance, I read Fred Singer's *Hot Talk, Cold Science*, and it actually sounded pretty good (in 2001), until I did enough study to realize the numerous problems, many of which still exist in his newest (2007) book, long after the ideas have failed the tests of science. Later, I learned about his relationships with the George C. Marshall Institute (K Street), tobacco companies, ExxonMobil, etc.

I think that any real skeptic (in the SI sense) could only reach certain conclusions: First, the scientific evidence in favor of AGW is overpowering. Climate science is progressing as science usually does, giving better and better approximations to reality. There are arguments around the edges, as there always have been. Seemingly contradictory data eventually got explained, or else was found in error, as in the case of ground stations versus satellites. It is clear that the basic AGW thesis is well accepted by almost all relevant scientists.

Second, it is also clear that there was a strongly dissenting group of people, but, after a while, it became clear that even the scientists in this group are not behaving as such, and they seem to have definite agendas deriving almost entirely from politics or economics, not science. Occasionally, a scientist is hanging on to a theory after accumulating evidence should have disproved it.

Some of them turn out to be paid by ExxonMobil, the Western Fuels Association, or other groups who absolutely do not want CO_2 limitations or encouragement of nonfossil-fuel energy. Some are funded by highly conservative political groups/foundations who believe that any such restrictions will infringe on their rights, or think AGW can't be happening simply because the UN's IPCC says it is happening, or perhaps worse, that Al Gore says it is.

Some AGW-denialist tactics are similar to those of the Discovery Institute regarding evolution ("teach the controversy"). Some anti-AGW tactics are similar to those of RJ Reynolds Tobacco in fending off recognition of the smoking-cancer link. This is unsurprising, as some of the same people fought tobacco regulation, CFC regulation, and now AGW . . . such as Fred Singer and Frederick Seitz.

Anyway, I beg all SI readers to get informed as proper skeptics in this topic. The core anti-AGW people are denialists, not skeptics, but they are unusually good at fooling the true skeptics.

John Mashey
Portola Valley, California

The recent conclusions of the Intergovernmental Panel on Climate Change (IPCC) have many believing that the debate over global warming has finally been put to rest. As Skeptical Inquirer editor Kendrick Frazier notes in his opening comment to the May/June 2007 issue, "There will continue to be global-warming skeptics, and their questions have been healthy, encouraging the collection of ever-better scientific data" and the "mark of a truly scientific mind is the willingness to change one's views as better evidence arrives. That has been happening."

I have to wonder, however, how many minds have actually been swayed when individuals such as Steven Milloy, whose Junk Science Web site continues to post information that denies global warming and denies the human contribution to it, staunchly oppose the idea and any need to respond to climate change. Even after the IPCC released its findings, some members of Congress continued to refer to global warming as a hoax.

The problem, it seems to me, is that the battle lines are not drawn according to scientific findings but according to religious and political affiliation. While a healthy dose of skepticism is certainly beneficial for all facets of the discussion, concrete evidence and rational conclusions mean nothing in the face of religious and political fanaticism determined to deny whatever conclusions are drawn in contradiction to its beliefs.

In an example of how facts are not allowed to get in the way of beliefs, a number of scientists have recently spoken out about how the Bush administration attempted to influence findings on climate change to either downplay the conclusions or outright obfuscate the truth.

Perhaps even worse, the global warming naysayers more often than not approach the issue from the pocketbook perspective: Any response to global warming is bad for the economy.

These positions employ a kind of logic that ignores facts and defies reason. Certainly, Mr. Frazier is correct that skepticism helps advance research, but to what end? Can the accumulation of additional data actually sway the stubborn nonbelievers? So far, it seems that the biggest influences on public policy with regard to global warming will be politics and the ever-powerful wallet.

Ray Geroski

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Thanks for the summary of scientific research on anthropogenic global warming or AGW. Identifying the human impact on climate out of all of the "noise" of natural cycles represents a monumental scientific challenge. Deducing markers, learning how to estimate past atmospheric content and temperatures, canceling out natural cycles, understanding feedback effects, and simply identifying all of the greenhouse-gas sources are the great scientific puzzles. The work continues, with much more to be learned. The science is openly challenged. But should we also challenge the economic assumptions about mitigating climate change?

Many people question the emerging science. These folks seem to (1) cite one of a small number of dissenters with some scientific credentials, (2) dismiss the consensus view as fear-mongering by scientists looking for study grants, or (3) insist that human actions are not significant relative to natural variations. The doubt often has an economic component. Most participants in the discussion of climate change, regardless of their position, assume that any policy designed to reduce anthropogenic greenhouse gas (GHG) emissions will penalize the economy. Climate mitigation proponents argue that the costs are a small price to pay to avoid the problems of a warming planet. Others question whether current science offers sufficient certainty to justify voluntary income reductions. If one believes that a cooler planet will cost money, then why should one country disadvantage its economy by reducing GHG emissions? Won't that country simply lose markets to countries that presumably keep their costs down by emitting high CO_2?

This economic assumption is questionable and misleading. At current fossil fuel prices, consumers pay three to five dollars to produce one ton of carbon dioxide emissions. However, only 11 to 13 percent of the potential energy in fuel burned in the United States is converted to useful energy services, while countries like Denmark, the Netherlands, and Finland convert up to 25 percent of the fuel energy to useful work. Studies indicate the United States could profitably invest $350 billion in proven technology to improve the efficiency of thermal and electrical generation. This would greatly improve manufacturing competitiveness while reducing total U.S. CO_2 emissions by 20 percent. Other investments in transportation and end-use energy efficiency could profitably slash GHG emissions by another 20 percent. These assertions go beyond theory. Organizations I have led have invested over two billion dollars in 250 separate projects since 1977, and those projects have achieved at least double the efficiency of the U.S. heat and power system, saving money and reducing GHG emissions.

The widespread opportunities to profitably reduce GHG emissions invert the climate change policy argument. Firms and nations investing in profitable fossil fuel efficiency are improving profits and gaining market share. It is time we all stopped paying to warm the planet.

Thomas R. Casten
Author, *Turning Off the Heat*
(Prometheus, 1998)
Chairman, Recycled Energy Development
Westmont, Illinois

Author Stuart D. Jordan Responds to Critics:

The topic of climate change driven by global warming is clearly generating a lot of heat. In reply, it is important to note that my own articles are reports of research performed by thousands of scientists worldwide, whose work has appeared in the peer-reviewed scientific literature. This leads directly into my reply to the first critic.

Mr. Titus claims that there is no evidence that "overwhelmingly presents a conclusion [for, in his words, 'so-called global warming'] that additional research confirms." I believe that, if Titus reads my article carefully in light of the above comment regarding the sources, he might reconsider this view. However, he raises an even more disturbing point when he suggests that scientists should stick to their research and not attempt to assess the most probable outcome of these thousands of refereed studies—which overwhelmingly support the existence of significant recent global warming. Accepting this approach would conveniently serve the interests of those who wish to do nothing to address the problems caused by global warming.

Thomas Gray seems to feel that this refereed worldwide research constitutes "the madness of the crowd" and that the associated climate change is a "popular delusion." That needs no response. However, the expression in his second paragraph, "this scientific controversy," does require one. If Gray can demonstrate that a significant number of active research scientists *who publish in the refereed scientific literature* have presented convincing evidence for a scientific controversy that calls the current rapid global warming into question, let him present it. Otherwise, one is reminded of the approach of the creationists, who have moved from creation science to intelligent design, and now on to irreducible complexity in their desperate effort to persuade the rest of us that there is a real scientific controversy where none exists. Much of what is written in denial of the recent global warming appears in nonrefereed pamphlets, tracts, and books published by the deniers.

Todd Seavey is correct that current climate models, by which I assume he refers to the so-called General Circulation Models (GCMs), do not deal with the ice ages, but he fails to note that they do not attempt to. The Milankovich effect, thought to be responsible for these large-scale global coolings, is generally not included in the current models, which are dedicated to explaining the variations in the mean global surface temperature over the past one thousand years. For this, the recent climate models have done an admirable job. The comments in his second paragraph suggest that he is noting, correctly, that correlation is not cause; but they also suggest that he has not read carefully the large body of evidence in my article that supports the robustness of the current evidence for climate change.

Alan Cheetham seems to think I have presented "no scientific information." I would suggest that he might reread my article. Perhaps Mr. Cheetham was looking for an original research paper and not a critical review. The rationale for these articles was to present a scientist's perspective on a major scientific problem of genuine concern to all of us. A single research paper could not do that. Cheetham notes correctly that one scientist who analyzed the "hockey stick" made an error in his analysis. However, these data have been reanalyzed, the error has been corrected, and the extremely rapid and disturbing rise in the mean global surface temperature over the last three decades is still there. This is not noted by the critic. He is simply wrong in suggesting that the recent rapid rise is not abnormal when compared to the last one thousand years.

James Libby errs in saying at the outset of his comments that the latest IPCC document "was not written by scientists, but edited by government and NGO bureaucrats." Perhaps he was thinking of the Summary for Policy Makers, which is entirely different. Many terms that he finds offensive are in fact direct quotes one can find in the extensive report I did use, *The Scientific Basis*. He alludes to "the really serious objections" of the global-warming minimizers and deniers that I do

not address. Melting ice caps on Mars is a current favorite. Before any conclusion can be drawn from this work, we would need to consider, among other things, a great deal more of the Martian geohistory than we know today. What we *do* know is that a postulated increase in solar radiation is not the cause of any recent melting of the Martian polar ice caps. An upper limit has already been placed on recent changes in solar radiation that is far too small to produce the alleged effects. It is also necessary to correct a misconception of some competent meteorologists, of whom the distinguished Richard Lindzen of MIT is mentioned by Mr. Libby. While these scientists are right in noting that models cannot predict what the local weather will be even two weeks from now, climate modeling is quite different. When much longer temporal and spatial scales are involved, boundary conditions are changed and fast, local, large-scale fluctuations damp out rather quickly. Libby's final paragraph offers a flat denial of the evidence for anthropogenic causes of global warming. I recommend my second article to him.

John Colling brings in the Danish meteorologist Henrik Svensmark and well-known global warming skeptic S. Fred Singer of the United States. Their effort invokes the Sun. The original idea was based on an interesting but limited correlation between phase of the solar cycle and cloud cover over the Northern Hemisphere. The key to this hypothesis is the well-observed decrease in the solar-based interplanetary magnetic field during solar minimum. This permits more cosmic-ray penetration into the Earth's atmosphere, more ionization of the atmospheric gas, and more condensation nuclei for cloud formation. However, further investigation showed that the correlation became weak when extended to a larger area, and even went negative for a while when extended in time.

John Rice uses an unfortunate term in describing the current science I report as "popular theories," suggesting that global warming is the result of marketing on the part of climate scientists. To show how wrong this is requires that readers understand an important point about *all* science. Scientists are people who, like all others, make mistakes, but science itself is uniquely self-correcting. There are two ways a research scientist can make a reputation. The best way is to get it right. But the other way is to show that someone else got it wrong on an important question. Those who feel that what scientists publish is just as full of bias as the work of anyone else in a field where the results cannot be confirmed or disconfirmed are simply wrong. Scientists occasionally get it wrong, but, when they do, there will always be other scientists ready to pounce on the error and correct it. Unfortunately, Rice also errs in stating that the current warming "has proceeded at a very steady pace since" the 1800s. There is nothing steady about the rapid warming of the past three decades, in relation to preceding rises since the 1800s.

There is nothing steady about the rapid warming of the past three decades, in relation to preceding rises since the 1800s.

Jean Meeus writes from Belgium about "this period of mass hysteria about global warming." He declares without evidence that the Medieval Warm Period was warmer than the present, thus disagreeing with an enormous number of scientists whose recent research says otherwise. He also declares that the current warm period is due to solar activity. I recommend that he read my Internet version for strong evidence against that notion, based on a large body of recent observations and the refereed research it has generated. The one place where I agree with Meuss is that we can expect a growing number of skeptics to become vocal, especially in the public arena. To which I advise the skeptical reader to check the source of his or her claims.

Michael Wilson is most disturbed by my conclusion that the benefits of global warming are not given a fair hearing. I did not deny that there could be benefits. But even the most obvious ones—a warmer climate in currently cold regions and the possibility of a more productive agriculture there (which also depends on soil and rainfall that may not follow the warming)—could also involve increasing biostress and more deadly pathogens that could cancel the benefits. To this, one adds the already measured rise in sea level, the known increased melting of glaciers, ice caps, and ice sheets, reduced agricultural productivity in many currently productive areas already studied, an increase in deadly forest fires, and a host of others not even mentioned in my article. It is very hard to convince oneself that these already occurring, and often accelerating, harmful processes can be compensated equally by global warming benefits. Mr. Wilson may conclude otherwise, but I certainly cannot.

I have devoted this response to addressing the critics of my article, as appropriate. Clearly I am more in agreement with the supporting comments. Nevertheless, I would note to the critics that I might be more even-handed than they seem to believe, having commenced studies of global warming in 1998 when I thought the Sun, the major area of my expertise, might indeed be the primary driver. The work of large numbers of competent climate scientists and a few investigations of my own have since convinced me otherwise. I have co-offered proposals for one international and two national symposia on this subject. The former and one of the latter were accepted, and the symposia have taken place. In one case, at my bequest, the two keynote speakers, given equal time, were Drew Shindell, Jim Hansen's well-know colleague and a supporter of the current near-consensus, and Sallie Balliunas, a competent critic of it. Checking my more extensive Internet article, you will find that I advocate reexamining the nuclear power issue, among others, one of the few areas where I agree with the current administration in Washington. This has not made me popular with my Sierra Club friends, but I believe the engineering in this area is sound and the issue worth exploring.

However, the most important point I would make is to check the competence of the people who are offering views on global warming and climate change. Since big money is at stake, this will inevitably provoke—and is provoking—an intense public debate. I hope we can all agree that the starting point for these debates should be the

PSYCHIC RESEARCH LAB CLOSES • DA VINCI'S REAL CODES • SYLVIA BROWNE'S BLUNDERS
Skeptical Inquirer
THE MAGAZINE FOR SCIENCE AND REASON
GLOBAL WARMING
A Position Paper
Einstein and the Myth of Consistent Skepticism
SCIENTIFIC INQUIRY HAZARD
Debunking The Secret
Theatre of Science
Published by the Committee for Skeptical Inquiry

Our article on global warming sparked a flood of letters, and we have placed them and the response to them in our special Follow-Up section in this issue. Here are letters on other *topics.*

—*EDITOR*

Einstein and the Myth of Consistent Skepticism

"The Myth of Consistent Skepticism: The Cautionary Case of Albert Einstein" by Todd C. Riniolo and Lee Nisbet (May/June 2007) is a good common-sense article that skeptics should always keep in mind. Unfortunately, the article's authors fell victim to their own biases. Apparently they started the article with the conception that Einstein approved and even supported the USSR Communist regime and its actions. While his early attitude toward the USSR was not the blatantly anticommunist one many of us had and still have, it was not wholly approving either. I suggest that anyone interested in what his attitude really was should read Walter Isaacson's *Einstein: His Life and Universe*. Although, in the prewar years, he would not join efforts to condemn the atrocities of Stalin and his cohorts, he never would accept invitations to speak or teach in the Soviet Union. In fact, he was blasted by a group of their scientists for his attitude and actions. It is uncertain why he didn't immediately condemn Soviet atrocities in view of his lifelong abhorrence of dictatorial organization and control. There are a number of possible reasons for this mystery, but this is not the place to go into that. His postwar years were definitely anticommunistic as were many of his prewar statements. It is disconcerting that the authors did not give a complete picture of this situation.

Was Einstein consistent? Skeptics should not be consistent in their decisions, e.g., always maintaining the same conclusions. Decisions should be based on the latest facts known, and there are times, in the face of new knowledge and differing situations, that they should be reversed. Thus, this lifelong pacifist signed the letter to President Roosevelt that probably ensured the atom bomb would be developed. He was never a mindless pacifist and always let it be known that he thought nonuniversal disarmament would lead to disaster. After the bombs were dropped, he was sorry he had endorsed their development, having based his decision on faulty information (that Germany was also energetically developing one).

This scientist also helped start quantum mechanics but spent the last half of his life actively assaulting it.

Einstein was a genius, but he was a genius who was human.

Frank Hanema
hagefra@comcast.net

Their beef with Einstein is that he was not sufficiently critical of the Soviet Union. They quote a 1948 letter in which Einstein wonders if the excesses of the Soviets were necessary for their survival. But, during World War II and shortly after, the Russians were considered our great allies: at the cost of great suffering, they were instrumental in defeating the Nazis, and we looked forward to a nuclear-powered world paradise hand-in-hand with the Russians. Our disillusionment came later. But even in that 1948 letter, Einstein said: "I am not blind to the serious weaknesses of the Russian system of government and I would not like to live under such government." Moreover, the article did not mention whether Einstein changed his views after 1948 (he lived until 1955). Skeptics respond to new information, but it may take time to evaluate the information.

Riniolo and Nisbet are too eager to pass judgment on Einstein. They object to his inclusion on the list of ten outstanding skeptics of the twentieth century. But Einstein was a skeptic. And he was certainly outstanding.

Marvin J. Schissel
Roslyn Heights, New York

Einstein has consistently been portrayed as an ineffectual and naïve idealist in regard to his pronouncements on various social issues. Now his views on Stalin and Hitler are being used to illustrate that all skeptics are, at best, selectively skeptical. Riniolo and Nisbet's point is fairly taken. However, the myth that Einstein was a naïve and superficial thinker on nonscientific issues was shattered by an April 2007 publication from the Princeton University Press.

Readers interested in the depth and sophistication of Einstein's views are encouraged to check out *Einstein on Politics: His Private Thoughts and Public Stands on Nationalism, Zionism, War, Peace, and the Bomb*. Walter Isaacson, author of the recent best-seller *Einstein: His Life and Universe,* said, "This book is both fascinating and valuable. By reading Einstein's political writings in their proper historical context, we can see how his politics reflected a deep sense of moral responsibility and a coherent vision of justice and social order."

Wayne Rowe
Fife Lake, Michigan

Todd Riniolo and Lee Nisbet maintain that "consistent skepticism" doesn't exist, then they strongly criticize Albert Einstein for not possessing this nonexistent quality.

I was a little surprised to see Riniolo and Nisbet refer somewhat routinely to Einstein's "great mathematical mind." It is true that he was a good mathematician by lay standards (any physicist is), but mathematicians themselves do not rate him very highly. Most of the "hard" mathematics of relativity (especially the general theory) was done by co-workers. Einstein himself freely admitted his (*relatively*) poor mathematical abilities. Oh, and musicians did not rate his musical skills highly either. Einstein's great feat was explaining simultaneously a huge number of previously problematic observations (such as mass-energy equivalence). Journalists have unfortunately built up a huge mystique around Einstein that often does not agree with the scientific facts.

David J. Fisher
david.fisher26@btinternet.com

Todd C. Riniolo and Lee Nisbet respond:

The readers' comments make some excellent points (e.g., we overstated Einstein's mathematical skill, we could have presented a wider picture of Einstein's views, and we have our own biases). However, several issues deserve a response. First, Einstein was inconsistent when evaluating Soviet atrocities in his later years, leading up to his death in 1955. We actively searched for evidence that Einstein changed his views after

the 1948 letter to Sidney Hook (referenced in our paper as evidence that Einstein justified Soviet actions inconsistent with his views on political liberty). We found evidence only that his views did not change. For example, in Einstein's (1950, p.187) book Out of My Later Years*, he further justifies the Soviet actions and expands his arguments in a letter to Hook (May 16, 1950). Even as late as 1952 (once again, readers are referred to Hook's autobiography, because it relies on Einstein's personal correspondence and provides the dates of the letters), he is inconsistent. If first-hand evidence does exist that he later became a consistent skeptic when evaluating the Soviet Union, we would be pleased to have that information forwarded to us.*

In addition, our article (in an effort to be concise, as journal pages are limited) focused on only one aspect of Einstein's inconsistent skepticism. We do not dispute that in some areas Einstein was skeptical, and, in hindsight, should have clearly articulated that point. However, remaining concise also limited us to discussing that one example of Einstein's inconsistent skepticism. For example, Einstein's correspondence with Sigmund Freud shows he uncritically considered Freud an outstanding thinker who possessed elite critical judgment. (At the time, Freud was being vehemently and justifiably attacked by academic psychologists who viewed his theories as quackery.) Likewise, he also uncritically evaluated economic claims, repeated economic myths, and advocated central planning in the first issue of Monthly Review *(May 1949). Many others examples exist.*

Thus, we encourage you, the reader, to consider all the evidence (both positive and negative) when making your own determination about Einstein's skepticism.

Finally, Einstein was only used as a case example to illustrate our more important point that cognitive biases cause everyone (even the elite thinker) to be inconsistently skeptical in certain situations. We hope that message does not become lost in the current discussion.

Scientific Hazard Symbol? Forget about It!

I like to think of myself as a lifelong skeptic. As an adolescent, my favorite book was Martin Gardner's *Fads and Fallacies*; I rejected God at age fourteen; I've spent much of my journalistic career as a basher of UFOs and like silliness; and I'm Carl Sagan's biographer. I've also read and enjoyed your magazine for more than a quarter of a century. In addition, I still have a sense of humor. That's why I'm hoping Alan J. Scott was really kidding in his self-professed "whimsical" proposal to develop a "hazard symbol" for the labeling of pseudoscientific literature—a sort of Good Housekeeping seal for distinguishing between good science and goofballery (May/June 2007).

Unfortunately, tongue-in-cheek schemes for social reform sometimes run away from their creators. I fear that'll be the fate of this one, too. I've been to enough CSI gatherings to know that there's a tiny but irritating minority of self-righteous windbags out there (you know, the ones who bend your ear for thirty minutes with their theory of what caused Moses's "burning bush") who might try to turn Scott's light-hearted scheme into reality.

If so, then please, for Sagan's sake, forget it! The last thing skeptics need is to be perceived as epistemological meter maids who run around issuing parking tickets for "scientific affronts." We'd look like a gang of Inspector Clouseaus! Let's stick to reasoned discourse and skip the simple-minded gimmicks.

Keay Davidson
Science Writer
San Francisco Chronicle
San Francisco, California

Alan J. Scott replies:

I see Davidson's concern and, for the most part, agree with his statements. For me to run willy-nilly around stamping everything I deem as pseudoscientific sludge with a symbol that people should mindlessly support goes against every bone in my body. Davidson is preaching to the choir on this point. It flies in the face of a common fallacy of argumentation—the appeal to authority—mentioned in Sagan's pivotal book A Demon-Haunted World. *It runs counter to developing people's critical and scientific thinking. Such thought-police actions should incite a backlash of intellectual criticism.*

I offer some more common ground by which most readers of the Skeptical Inquirer *can agree upon, concerning my whimsical symbol. Scientific affronts have a taxonomy, and each category in this taxonomy can have a spectrum of deleterious affects on society. It is important for people to know this so as to better manage and function in a world awash in junk information. This is the main point of my article.*

The symbol is simply a quick summary. It is analogous to an "A" grade for a well-done term paper in college. It is analogous to the fire-diamond hazard symbol where a number in the blue diamond represents a level of health hazard.

The symbol relates to an economy of thought. It can make plowing through the muck of nonsense easier. If the symbol is used without careful thought, consensus of scientific experts, and protection against haphazard application, then it should never see daylight and be locked away, kept as an intellectual curiosity.

The Top 10 Myths about Evolution: Authors Respond

We were pleased to receive a mostly favorable review by Kenneth W. Krause of our book *The Top 10 Myths about Evolution* ("Defending Evolution, but with a Cop-Out," May/June 2007).

However, Krause states that our book includes a cop-out, because, in the chapter debunking Intelligent Design, we allow that belief in God is not incompatible with evolution or science in general. Our main goal in that chapter was not to wade too deeply into the theism/atheism debate but to highlight the problems of injecting unnatural or divine explanations into the practice of science.

Our book was written for a high-school-educated lay reader who may or may not have religious views. Its tone is mild and inviting, as opposed to dismissive or, even worse, condescending, a tone which seems to be in vogue of late. Yes, we do allow for—but don't endorse—a variety of theistic evolution akin to deism. In our view, a break with all religious believers does nothing to help educate the public about the facts of evolution. In fact, it may even have a polarizing effect, alienating those believers who may be open-minded to evolution.

Moreover, one of our aims in writing the book was—as Ann Druyan recommends on the back cover—"to convince those who have yet to accept the ancient legacy of life on earth as revealed by Darwin and affirmed in countless ways by the generations of science ever since."

We do take the question of the compatibility of evolution and faith seriously, and this is why our book includes an endnote about this question. Since Krause expressed fondness for our "generous endnotes," we're surprised this note went unmentioned. We include part of endnote 33 (p. 148) here for the benefit of those Skeptical Inquirer readers who have not read our book:

> There are a number of philosophical problems with regard to theological claims,

and many philosophers have found the solutions offered by theologians to be unsatisfactory. Some of these claims include the existence of, and explanations for, God, angels, miracles, prophesies, and immortality. A problem specific to evolution concerns why a morally good creator would permit natural selection—a process rife with death and suffering—to be a necessary mechanism in the appearance of the diverse life-forms on Earth, including humans.

Charles Sullivan
Cameron M. Smith
www.toptenmyths.com

Ian Stevenson

I was pleased to note the acknowledgment in the May/June 2007 issue of the recent death of Ian Stevenson in February 2007 (not 2006, as your notice read). Those of us who knew him knew that he embodied the best of skepticism. Though, in the latter part of his career, he turned his attention to controversial phenomena, his hundreds of scholarly works always considered multiple alternative interpretations of his data. Indeed, his 1983 paper on cryptomnesia ("source amnesia") and parapsychological claims remains a classic. With his characteristic empirical rigor and academic rectitude, he regarded the evidence from his 2,500 cases "suggestive of reincarnation" as strong enough to permit, but not strong enough to compel, a belief in postmortem survival. His greatest legacy is the spirit of open-mindedness and allegiance to empirical data that he encouraged in his many students.

Bruce Greyson, M.D.
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Art of Improvisation

As a student (though not a practitioner) of the conjuring and mentalist arts, I enjoyed Massimo Polidoro's series on "The Devious Art of Improvising" (concluded in May/June 2007). I have used the principles for years to amuse myself and astound my friends.

Upon arriving at the home of an unemployed actor friend to watch a rented movie, the telephone rang. As he left the room to answer it, I joked, "It's Hollywood calling." He returned with a shocked look, asking how I had known that the Hollywood Video store had called to tell him he had left his credit card. I soberly insisted that I often had such psychic flashes. He is a fellow skeptic, and I strung him along until he was beside himself. Finally, I mercifully revealed the confusion.

In the days before caller ID, I took to answering the phone with a sunny, "Hi there, you little cutie!" About 90 percent of callers were stunned, and asked, "How did you know it was *me*?"

Joe Hutchings
Seattle, Washington

The NDE Scale

I appreciate Benjamin Radford's summation of the NDE Scale [for assessing Near-Death Experiences] in the May/June 2007 issue that it "is a legitimate effort at bringing rigor to a subject notoriously difficult to quantify." That was the scale's purpose, to foster a scientific approach in a field prone to claims by both spiritualists and materialists that went far beyond the meager data. The scale is imperfect, and, as Radford noted, it is possible to score high on it without being near death. It was developed simply to assure that various NDE researchers were investigating the same phenomenon.

Radford was mistaken, however, that the NDE Scale "is rarely used or cited today." Citations of the scale in peer-reviewed journals have in fact increased in recent years; virtually every recent prospective study of NDEs has used it, and it has been translated by Dutch, French, German, Spanish, Portuguese, Hindi, and Chinese researchers.

Although the NDE Scale was initially developed on a modest sample of seventy-four NDEs, it has been validated in a recent sample of 292 experiencers in a sophisticated Rasch analysis by skeptics Rense Lange and Jim Houran in the *British Journal of Psychology*, and a test-retest challenge found the NDE Scale statistically reliable over a twenty-year period. Of course, establishing the reliability and validity of a measure of NDEs implies nothing about the cause of the experiences.

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A Little Matter of 2001

A publication devoted to accuracy must be particularly scrupulous in editing, since any errors may well be used to undercut the skeptical position. My jaw dropped when reading "Sylvia Browne's Year to Forget" in the May/June 2007 issue, which stated "there have been no foreign-instigated terrorist attacks on American soil since 1993." I seem to recall an exception on September 11, 2001. Please, please, fellas, be more careful. I don't want my favorite magazine to become a laughing-stock.

Joe Hutchings
Seattle, Washington

Our author attempted to correct the error, requesting in an e-mail well before production that we insert the missing phrase "with the exception of 9/11," but, somehow, I missed his message, and the error wasn't corrected in proof. My apologies to him and to readers.

—*EDITOR*

Framing Scientific Issues

Scientists with new ideas and frameworks whose peers dismiss or seemingly ignore them (but perhaps shouldn't), and those who write to justify science and scientific issues, should read George Lakoff's *Don't Think of an Elephant*. Benjamin Wolozin has done an excellent job of summarizing the book in his essay "The Art of Persuasion in Politics (and Science)" (SI January/February 2007). Wolozin nails the essence of Lakoff's message—that scientists and rationalists should carefully frame their issues, then use supporting metaphors, language, and talking points.

Who should read this book? All academics, students, and laypersons who wish to positively impact the national dialogue on evolution, paleontology, astronomy, and other issues important to science and society (stem cells, global warming, etc.). Lakoff has written another, more recent, paperback titled *Talking Points* (Farrar, Straus, and Giroux, N.Y.). It further guides and exhorts readers to the importance, and methods, of bringing others to support a particular view in politics, science, and society.

There are critical reasons for mastering the art of framing, communicating, and dialogue. About half of Americans buy into creationist or ID explanations for origins, for example,

and more than half believe such should be considered in science curricula—including President Bush ("Why not hear both sides?"). It is thus absolutely essential that scientists and rationalists learn the art of framing issues and supporting them with talking points, and generally speak truth in response to fiction (and fanaticism). To do otherwise is at peril to our principles, our society, and the global community.

Donald L. Johnson
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Hitler and "Atheism"?

The Rev. Ian Alterman, in his letter to the editor (May/June 2007), excoriating Chris Volkay's criticism of religion, includes Hitler in his pantheon of "committed atheists," along with Stalin, Mao, and Pol Pot, who murdered "over one hundred million people" in the twentieth century. Alterman notes that "Hitler was not a Christian; he simply used Christianity to further his agenda."

How, pray tell, does the learned reverend know this? The facts are that Adolf Hitler was raised in the fervent, anti-Semitic Roman Catholicism of rural nineteenth-century Austria, and he never renounced his religion, nor was he ever excommunicated despite the magnitude of his crimes. He referred to God repeatedly in *Mein Kampf,* and his first order of business when he seized power was to outlaw all of the freethought groups in Germany. He had widespread support among the Catholic and Lutheran clergy of Germany, many of whom were dues-paying members of the Nazi party. The puppet ruler of fascist Croatia, a Nazi ally, was a Catholic priest who was later executed for war crimes. Hitler required German officers to swear loyalty to him "bei Gott," and his soldiers went into battle with "Gott Mit Uns" ("God with us") emblazoned on their belt buckles. There were chaplains in all branches of the German armed forces, including the murderous Waffen SS. Some atheist!

No, it is not historical evidence on which Alterman and others have based the accusation that Hitler was an atheist. It is quite simply a matter of religious propaganda. Anyone as evil as Hitler and his followers (including Goebbels, a Catholic who received communion weekly with his family) simply had to have been atheists, who, after all, have no moral compass, lacking a belief in a Sky Father. In a related vein, I have heard people allege that the September 11, 2001, terrorists were in fact atheists and not fanatical Muslims. God-fearing people would never commit such foul acts. Only atheists. As Goebbels himself said, a lie repeated often enough becomes a truth.

By the way, Rev. Alterman, are you aware that Stalin was once a seminarian in the Orthodox Church and was educated by Jesuits? Why then, shouldn't Christianity shoulder the blame for his murderous deeds?

Dennis Middlebrooks
Brooklyn, New York

Letter writer Rev. Ian Alterman erred when he called Adolph Hitler a committed atheist. Not being a good Christian doesn't automatically make one an atheist. Yes, Hitler used Christianity in a demented way to further his warmongering cause, and he had issues with the Roman Catholic Church. Hitler may not have been a true Christian, but he was definitely a theist—a fanatical one at that.

I have read Hitler's book, *Mein Kampf,* translated into English by Ralph Manheim. Throughout, Hitler makes references to a "creator," a higher power, God, and the Lord. He opines about the religious conditions in pre-World War I Germany and how religion should have been better protected from politics. He declares that Protestantism is a better defender of German interests. Such statements show that he definitely believed in the existence of a God.

One perfect example of his religious fervor is the final paragraph of chapter two: "Hence today I believe that I am acting in accordance with the will of the Almighty Creator: by defending myself against the Jew, I am fighting for the work of the Lord." An atheist would never speak that way.

Paul Griese
Houston, Texas

The Rev. Alterman's response to Chris Volkay's parody (January/February 2007) contains a few logical fallacies.

First, he states, "Hitler was not a Christian; he simply 'used' Christianity to further his agenda." Since Hitler was born a Catholic, raised a Catholic, and enjoyed a cozy relationship with the Vatican, I'm not sure what Alterman means by "not a Christian." Could he be defining the term by actions rather than by self-identification? If so, that is a neat trick: to absolve Christianity of all historical atrocity—by labeling those actions as un-Christian. He could also argue that the Inquisition and the Crusades were "not Christian" but merely using Christianity to further an agenda.

Second, he plays the old numbers game—"More of you were guilty of atrocity so that makes us better." This argument is invalid for two reasons—it implies a causal relationship that doesn't really exist, and it ignores changes in historical opportunity. For the record (and to play the same "numbers" game), I also believe Alterman undercounts victims of religious atrocity.

My point is that even the most skeptical of us can have blinders—if we don't like facts, we all can twist them to fit our vision of what is real. I think Alterman's letter, by its unedited spin, validates Volkay's original spoof.

Brad Rudy
Marietta, Georgia

If Rev. Ian Alterman knew, or cared, more about "history or the facts," he would not be peddling the popular lie that Hitler was a "committed atheist" who "simply 'used' Christianity to further his agenda." Even if one allows some cynicism toward Hitler's numerous public statements of piety (more than any previous German leader for a generation), a "committed atheist" does not close down the German Freethinkers League, hand its HQ over to the church, and then give a speech saying he had stamped out the atheistic movement. Nor does a "committed atheist" insist on religious education or spend years attempting to unite the Protestant churches into one Reich Church.

One wonders why people like Alterman persist in cultivating the myth of Hitler's atheism in spite of the absence of God denials, or affirmations of atheism, by the Fuhrer, even in private. Could it be that, without Hitler, the only mass-murdering atheists they are left with are all communists? Every one of them. Then it becomes apparent that the crimes of Stalin et al. were inspired by their communist faith and their atheism was incidental, and what looked like a big stick to beat atheists with suddenly becomes a little twig.

Stephen Moreton
Warrington
Cheshire
U.K.

I had to laugh at Rev. Ian Alterman's "defense" of Christianity. Really, that's it? That the Christians have killed fewer people than the

Nazis and the communists? And that they preach (if not practice) love, peace, forgiveness, etc.? I wonder how that defense might work for a serial killer in a courtroom: "Your Honor and Ladies and Gentlemen of the jury, my client has killed fewer people than Ted Bundy and is generally in favor of altruistic behavior."

Dennis Wilkinson
Irvine, California

A Middle Ground?

I am a subscriber to the SKEPTICAL INQUIRER and a card-carrying member of the Skeptic Society. I am also a card-carrying member of the Baha'i Faith. It really bugs me that, in the last year or so, your material is beginning to sound more like Atheists International (if there is such an organization) than honest, truth-seeking reporting.

There is a middle ground between the hellfire breathing "Christian" literalist anti-science fundamentalists and the self-styled noble scientific antireligion nonbelievers.

Out here in the real world, there are millions of Christians, Jews, Muslims, Hindus, and Baha'is who believe that scientific findings reinforce our faiths' authentic teachings. In fact, the Baha'i Faith has unity of science and religion as a major tenet. That is, the truth is found when they work together in the search for knowledge.

There is an old saying: "Religion tells who; science tells how." As for the "Christian" literalists—apparently, it has never occurred to them that God would speak to his/her prophets in a language that was appropriate to their times, places, and understanding. I mean—come on—how would you explain biological evolution and plate tectonics to a bunch of—by our standards—illiterate sheepherders?

Please include some opinions that show recognition of and respect for believing scientists—whether you editorially agree with them or not.

Thanks and keep after the cranks.

Janet M.C. Tanaka
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FIX YOUR RUPTURED DISK WITHOUT SURGERY?
Continued from page 49

doesn't last. She started to say that hers *had* lasted for a long time. He didn't want to hear that, so he quickly interrupted to tell her (1) that her problem must have been mild; (2) that it was a blessing that *her* relief had lasted, since it didn't for other people; and (3) that he knew patients who had such severe pain from the injections that they would never do it again.

He also claimed, without giving supporting evidence, that the treatment "strengthened the ligaments." And he claimed that many diabetic patients think they have numbness in their feet from diabetic neuropathy when the real cause is unrecognized disk disease, and the numbness goes away after decompression treatments. This sounds screwy to me, because the pattern of numbness is very different in these two conditions, and it's unlikely a doctor would mistake one for the other.

He commiserated with one patient who was taking Oxycontin, saying that it can destroy your kidneys and liver. This simply isn't true—except maybe for IV drug abusers, or patients who already have kidney or liver disease.

Perhaps the funniest thing that this chiropractor admitted was that he started using the DRX 9000 because chiropractic wasn't working well for his patients. D.D. Palmer, who invented chiropractic, must be turning over in his grave: he claimed chiropractic could fix everything from soup to nuts. Recently some chiropractors in an online forum had a serious discussion about whether a person could obtain immortality if his spine were maintained in perfect alignment; opinions varied.

Baldwin kept asking, "Aren't you surprised that hospitals and orthopedic doctors don't use this treatment?" No, I'm not surprised at all. Other chiropractors are not impressed. Here's what one chiropractor, who will remain anonymous, had to say: "I find those that have undergone the decompression indicate that either (1) it was painful or (2) they felt better for about a month. The equipment is expensive, the protocol is for treatment five times a week for four weeks, and the charge is at least $250 a pop. The combination of expensive treatments and chiropractors is a lethal one."

I must admit that this "space age discovery" is a very effective decompression treatment: it decompresses the patient's wallet and does wonders for anemia of the chiropractic bank account!

My hat's off to these guys as salesmen. They are very good at what they do. Too bad it has nothing to do with real science or good medical care. I wouldn't buy a used car from these wheelers and dealers, much less trust them with my one and only spine. You can't believe everything you read in the newspaper.

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